Patents Act 1977 **Opinion Number** **20/17**

OPINION UNDER SECTION 74A

Patent	GB2494312
Proprietor(s)	Park Assist LLC
Exclusive Licensee	
Requester	Highlight Parking Systems Ltd.
Observer(s)	
Date Opinion issued	07 February 2018

The request

1. The Comptroller has been requested to issue an opinion as to whether claims 1 to 11 of GB 2494312 ("the patent") are novel or inventive in light of information said to have been made available to the public before the priority date of the invention.

2. Observations have been filed by the proprietor and observations in reply have been filed by the requester.

Preliminary matters

3. Before considering the detail of the patent and the alleged prior art and the relevance of one to the other I should consider the observations from the proprietor on the questions of publication and dating of the prior art document provided with the request.

4. Section 2(2) of the Patents Act 1977 states:

The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.

5. Accompanying the request is a document alleged to form part of the state of the art (D1 in the request), along with a witness statement from Mr. John Rossi explaining the background to that document and an extract from the document comprising two pages marked up to include page and line numbers for convenience of reference.

6. The proprietor argues in the observations that no evidence of publication of the

alleged prior art document has been provided and that there are no corroborating dates on the document or the two page extract.

7. In reply the requester provides a further witness statement from Mr. Rossi and supporting evidence of a flight booking to Abu Dhabi on 18 November 2009, seemingly for Mr. Rossi. The flight booking supports Mr. Rossi's second statement where he says that the document formed part of a presentation he gave in Abu Dhabi in December 2009.

8. Turning first to the issue of the date of the document, I can see little in the document to indicate a date of publication. However, the 36th and 37th pages of the document (the pages of the document are not numbered) are drawings numbered 000655/112 and /113 which are marked "PBM Building Services Ltd" and "Nov 2009" and the 38th page is a drawing numbered 00655/114 which is marked "PBM Building Services Ltd" (hereafter "PBM") and "Dec 2009". PBM was Mr Rossi's employer in 2009 according to his statement. I take it that the dates indicate that the original drawings were created by PBM in November and December 2009. I appreciate that a date marked on a drawing is not the same as a publication date and I conclude from the dates nothing more than that the overall document was created no earlier than December 2009. This is not inconsistent with Mr. Rossi's first witness statement at paragraph 10 where he states that the document was "*left with Imum early December of 2009*". Imum, or Iris Modern Urban Management LLC, employed PBM, also according to Mr Rossi's statement.

9. I can see no significant reason based on the papers before me to do other than take Mr. Rossi's statements at face value. The flight booking does however cause me some difficulty. By virtue of drawing 000655/114 being marked Dec 2009 I have taken it that the document was created no earlier than December 2009. However, apparently Mr. Rossi flew to Abu Dhabi on 18 November 2009. That Mr. Rossi flew to Abu Dhabi in mid-November does not of course preclude him preparing the document after he arrived in Abu Dhabi and incorporating a drawing also prepared after his arrival in Abu Dhabi and then leaving that document "*with Imum early December of 2009*" as he states. The opinion process gives me no mechanism to pursue this small potential inconsistency further. Consequently for the purposes of my opinion I shall accept that the document was passed to Imum in early December 2009, which is before the earliest date of the patent (see below).

10. This leaves the question of whether the document and the information incorporated into it "*was made available to the public*" and hence formed part of the state of the art according to section 2(2) of the Patents Act 1977.

11. From a variety of authorities including *Lux Traffic Controls Limited v Pike Signals and Faronwise Limited* [1993] RPC 107 it seems the question is whether the information in the document was made available to "*a person who was free in law and equity to use the information*" or if there was some fetter upon them.

12. According to the statement of Mr. Rossi he created the document in his capacity as an employee of PBM, incorporating information from Mr David Harrison of Highlight Parking Systems Limited, i.e. the requester of this opinion. The document was then passed to Imum by Mr. Rossi and from Imum to the Abu Dhabi Department of Transport. Although it does not affect my opinion, it is not clear to me if Mr. Rossi

has direct knowledge of the document ultimately being passed to the Abu Dhabi Department of Transport by Imum and when this happened, assuming it did take place. In his statement Mr. Rossi is clear that the information he received from Mr. Harrison came with no conditions of confidence and indeed was intended to be passed to Imum and the Abu Dhabi Department of Transport. His statement is equally clear that he passed the document to Imum with no conditions attached.

13. The observations from the proprietor point to the lack of corroborating dates and that "*there is no substantiating evidence that either* [i.e. the document or the marked up extract] *was actually published or publically disclosed*". There is no suggestion that the marked up extract existed in its marked up form before this opinion request. I take it that it is simply provided for ease of reference and that the relevant prior disclosure is found in the original document. Evidence of publication of the document itself and the date of that publication can only be found in Mr. Rossi's witness statements. As I have already said, I have no significant reason to question what Mr. Rossi says in his statements. I will therefore accept his statements at face value.

14. What I draw from those statements is that in "*early December of 2009*" Mr. Rossi passed the document to Imum and that that at some time earlier still Mr. Harrison passed to Mr. Rossi details of the requester's systems, those details being found in particular on two pages of the document, marked up as pages 29 and 30 in the extract. I am told that neither Mr. Rossi nor Imum were under any obligation to treat what they received in confidence. Based upon the information available to me, it seems to me that the passing of the document to Imum satisfies the requirement in section 2(2) of it being "*made available to the public*" as of "*early December of 2009*" and hence the document forms part of the state of the art for the invention.

The patent

15. Entitled "Method and system for managing a parking lot based on intelligent imaging" the patent is the result of an international application filed on 8 May 2011 with a priority date of 10 May 2010. It was granted with effect from 17 August 2016 and remains in force.

16. To quote from the start of the description, the invention relates to "*the management of a parking lot and, more particularly, to setting up and using a parking lot managing system that relies on intelligent processing of images of the various parking spaces.*". Figures 1 and 2, below, illustrate an exemplary parking lot to be managed and an embodiment of the overall system of the present invention respectively.

17. The parking lot is formed with entry kiosks 20, 21, aisles 11, 12, 14 separating rows of parking spaces 15, pairs of which are monitored by an associated camera unit 16. Each parking space 15 has a lighting fixture 24 in the ceiling and each row has associated row displays 18.

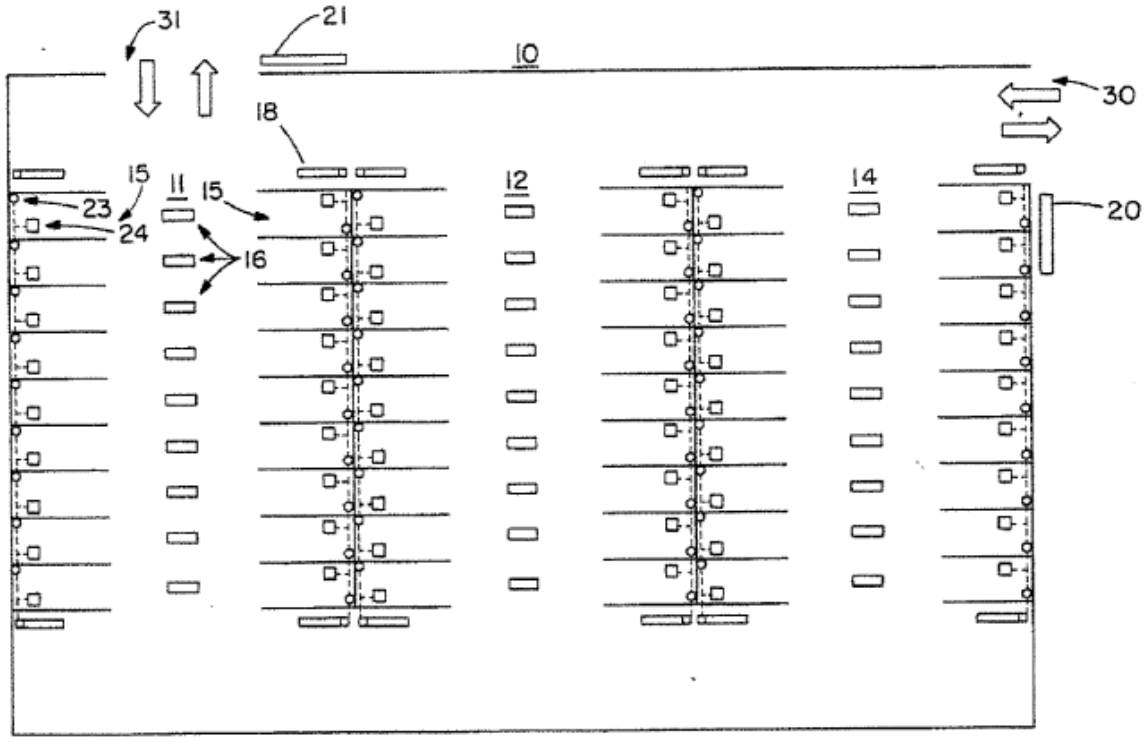


FIG. 1

18. The system includes the camera units 16, row controllers 42, a system controller 44 and a system user interface 46 which may be connected to additional external systems, as shown in figure 2.

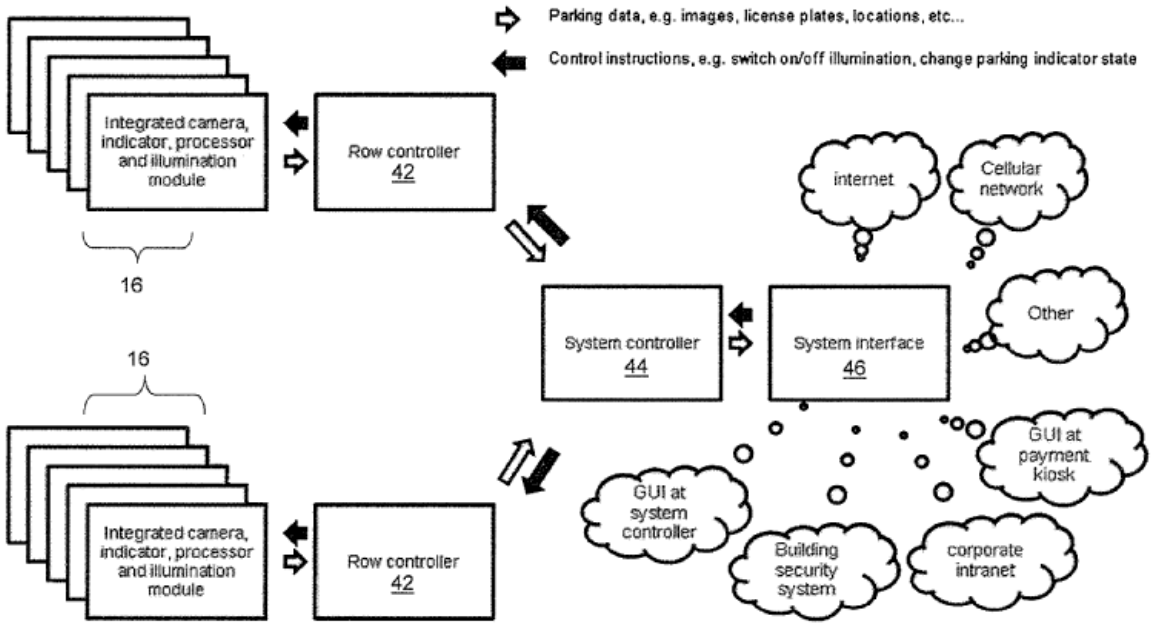


FIGURE 2

19. Each camera unit 16 monitors at least one associated parking space 15 by detecting

occupancy of the parking space, each camera unit also includes a high resolution camera and an LED indicator to indicate the occupancy status of the space by means of colours such as green to indicate a vacancy and red to indicate that the space is occupied. The high resolution camera allows a high resolution image of a vehicle occupying the space to be captured, stored at least in part and then processed to extract a vehicle identifier such as a license plate number or vehicle make and colour. Row displays 18 are controlled by system controller 44 directly or via the row controllers 42 and show the number of vacant spaces in a particular row. As described on page 15, entry kiosks 20, 21 may be used by a customer to locate a vehicle by keying in a license plate number or vehicle make and colour or inserting an access ticket encoded with a vehicle license plate number. System controller 44 then compares the keyed or encoded information with vehicle identifier information stored in a database regarding vehicles currently parked and identifies a location of the parking space associated with that vehicle identifier in order to direct the customer to the parking space in question by means of a displayed or printed map. A similar function may be performed using a smart phone or the like. The system may be used for tiered parking control, allowing "*differential pricing to be efficiently varied based on the location, type or demand down to the individual space of the car park. Alternately, this could be varied by amount of time spent in car park, number of previous times a vehicle has been parked, etc*" (see page 16).

Claim construction

20. Before considering the documents put forward in the request I will need to construe the claims of the patent following the well known authority on claim construction which is *Kirin-Amgen and others v Hoechst Marion Roussel Limited and others* [2005] RPC 9. This requires that I put a purposive construction on the claims, interpret it in the light of the description and drawings as instructed by Section 125(1) and take account of the Protocol to Article 69 of the EPC. Simply put, I must decide what a person skilled in the art would have understood the patentee to have used the language of the claim to mean.

21. Section 125(1) of the Act states that:

For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.

22. And the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1)) states that:

Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the

description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.

23. The patent includes a single independent claim, directed to a method, dependent method claims 2 to 9 and two omnibus claims respectively directed to a system for and a method of managing a plurality of parking spaces.

24. Claim 1 reads as follows:

1. A method of managing a plurality of parking spaces, comprising:

(a) monitoring a parking space with an imaging device of an imaging unit

(b) detecting, by said imaging unit, occupancy of said parking space;

(c) assigning said parking space, in which said occupancy was detected, an occupied status;

(d) obtaining, as a result of said parking space having said occupied status, a single high resolution image of a vehicle occupying said parking space, said high resolution image obtained by said imaging device;

(e) storing at least part of said high resolution image;

(f) charging a differential tariff based on a location of said parking space to an owner of said vehicle occupying said parking space;

(g) processing said high resolution image to extract a vehicle identifier of said vehicle from said high resolution image; and

(h) in response to an inquiry, by a customer, that includes vehicle information entered in the form of one of a keyed in licence plate number or a keyed in make or color of vehicle or an encoded vehicle licence plate number read from a receipt or access ticket and wherein said vehicle information is entered to permit comparison by a system controller:

(1) having the system controller compare said entered vehicle information to said vehicle identifier extracted from said high resolution image obtained by said imaging device;

(2) identifying a location of said parking space based on a known location of said imaging device that obtained said high resolution image, and

(3) directing said customer to said parking space.

25. The opinion request does not formally construe the claims, but rather compares each element of the claims in turn against the disclosure on pages 29 and 30 in the prior art document and common general knowledge. Consequently I take it that the requester finds the claims to be clear. This comparison in the request includes an assertion that step (f) in the method of claim 1 "*must necessarily be considered to be part of a method for doing business*" and goes on "*this feature must be considered to be excluded from considerations of patentability by Section 1(2)(c) of the Act*". The request is clearly for an opinion as to novelty and obviousness rather than whether the application relates to subject matter excluded under section 1(2)(c). It may be that the requester is implying that the claim should be construed as though step (f) were absent as a result of their allegation that the step is a step in a method of doing business. If so, this does not seem to me to be the correct way to construe the claim. Construing the claim is a necessary preliminary step in considering novelty, inventiveness or exclusion from patentability under section 1(2)(c). Consequently I will not consider whether step (f) amounts to a step in a business method and I will

not disregard step (f) from my consideration of claim 1.

26. Despite what I have just said, nevertheless step (f) in claim 1 causes me some difficulty for different reasons. I understand the notion of charging different tariffs based upon parking location, as explained on page 16. However, step (f) refers to charging an owner of said vehicle, whereas elsewhere in the claim there are only references to a customer. I can only find references to a customer in the application as filed, no references to an owner. I realise that in many cases the vehicle owner and the parking lot customer will be the same person, but that need not be the case and I can find nothing in the application to suggest that the system can identify a vehicle owner in the sense of a registered owner or keeper. I take it therefore that owner in step (f) should simply be taken to mean customer.

27. Step (f) also gives me cause for concern since, reading the claim in isolation, it is not clear to me how the charge is made. It is not explicit in claim 1, but there is an implication that the steps are in some way sequential. For example identifying a location and directing a customer in the last two steps must necessarily come after the relevant image has been obtained and processed. However, by the time of step (f) in the method no vehicle identifier has yet been extracted from an image and so I cannot see how there can be a differential tariff charged without an association between a particular parking space and a particular vehicle. The only description of charging comes under the heading Tiered Parking Control on page 16. This outlines several scenarios, but in each one a tariff is charged based upon a parking space location reconciled with a license plate number identified by a camera. I think I must construe claim 1 such that the charging in step (f) in the method is also based on the vehicle identifier extracted in processing step (g).

28. I will also comment here on the terms "*imaging unit*" and "*imaging device*". Both terms are used in the claims. Since it must deliver a high resolution image at step (d) in claim 1 I take it that the imaging device is a camera. Step (a) in claim 1 introduces "*an imaging device of an imaging unit*" implying that the device is a component within a larger unit. The description discusses the "*camera unit*" or "*camera module*" rather than the "*imaging unit*", but I assume these are all the same thing. Figure 3 and page 8 describe an embodiment of the camera unit including coloured LED indicators, two cameras, one or more processors, serial ports and optional software. The unit may also include "*LED area illumination*" according to line 31 on page 7. This confirms that the imaging device is found within a larger imaging unit.

29. Step (b) in claim 1 requires "*detecting, by said imaging unit, occupancy of said parking space*". By contrast step (j) in dependent claim 2 requires "*detecting, by said imaging device, vacancy of said parking space*". I can see no disclosure of any other form of occupancy or vacancy detector than a camera or imaging device. So I take it that "*by said imaging unit*" in step (b) should be taken to mean "*by said imaging device*".

The prior art

30. As discussed earlier, the prior art document in question is said to come from a presentation given by Mr. Rossi to Imum in Abu Dhabi in early December 2009. I

have already said that I will treat this as publication for the purposes of section 2(2) and hence the document formed part of the state of the art at the priority date of the patent which was 10 May 2010. Although I am treating the entire document as forming part of the state of the art, for the purposes of this opinion I will focus on the two page extract marked up by the requester as D3 and annexed to this opinion. The extract details three systems called Bay Monitoring, Baywatch and Car Finder. According to Mr. Rossi these are systems from the requester. Since the two pages are annexed to this opinion I will not describe them further here.

Validity

31. The request is for an opinion regarding both novelty and inventive step. In respect of step (f) in claim 1 the request urges me to disregard the step for the purposes of considering novelty, as I noted above, and then states "*All technical and patentable features are disclosed in D1*", but goes on to explain that step (f) is an obvious alternative to what is disclosed in the prior art document. I will return to the detail of this obviousness argument later. What I take from all of this is that the request seeks an opinion as to novelty in claim 1 on the assumption that I agree to disregard step (f) and, in the event that I do not disregard step (f), alternatively seeks an opinion as to inventive step. I have already said that I will not disregard step (f) in claim 1 for the purposes of this opinion and hence my opinion will relate to inventive step.

32. To determine whether or not an invention defined in a particular claim is inventive over the prior art, I would rely on the principles established in Pozzoli SPA v BDMO SA [2007] EWCA Civ 588, in which the well known Windsurfing steps were reformulated:

> *(1)(a) Identify the notional "person skilled in the art";*
> *(1)(b) Identify the relevant common general knowledge of that person;*
> *(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;*
> *(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;*
> *(4) Viewed without any knowledge of the alleged invention as claimed, determine whether those differences constitute steps which would have been obvious to the person skilled in the art.*

33. I have no guidance from the request to assist me with the detail of any of the *Windsurfing/Pozzoli* steps, except perhaps identifying the differences at step 3. In particular there is no evidence on the identity or the common general knowledge of the skilled person and no basis from which to consider the last step.

34. It seems to me that the notional person skilled in the art would likely be a team knowledgeable regarding the design, installation and operation of parking lot management systems. As for their common general knowledge, the only guidance to which I can turn is on page 1 of the description of the patent where the field and background of the invention are outlined. From this it seems that systems are known that quickly guide customers to available parking spaces. Such systems may use

ultrasonics or image processing as sensor technologies. Beyond this the patent does not admit any common general knowledge and specifically denies that known systems "*detect the type of object that is stored in the space, determining if it is a car, motorcycle, parking cart, or other object. They also do not recognize unique aspects of the vehicle, such as make, model, color, and license plate …*" (see page 1 lines 19 to 22).

35. I turn now to the differences between the prior art document and claim 1. The extract from the prior art document clearly describes *"A method of managing a plurality of parking spaces*" and *"monitoring a parking space*", as required at the start of claim 1 and the first part of step (a). I do not agree with the requester that the ultrasonic detector described on page 29 constitutes "*an imaging device of an imaging unit*" with which the monitoring is performed, as required by the end of step (a). As I noted above, the imaging device must generate a high resolution image and the prior art document gives no indication that the ultrasonic detector does this. However, on page 30 monitoring a parking space using a license plate recognition camera is clearly described and hence "*monitoring a parking space with an imaging device of an imaging unit*" is disclosed.

36. It is clear that the ultrasonic detectors described on page 29 of the prior art document detect the occupancy of parking spaces, but as I said above I do not consider these to be imaging devices. The Baywatch and Car Finder product is described as "*an extension of the bay monitoring system*", implying, but not stating, that the ultrasonic detectors remain present. Whether or not this is the case and despite the assertion of the requester, I can find no explicit mention in the extract of using the camera to detect occupancy as required by step (b). I do not feel that a camera "*continually looking for a licence plate to capture*" amounts to a clear disclosure of sensing occupancy using the camera. In the document itself, two pages after the extract (i.e. on what would be page 32 if the pages were numbered) there is a figure which is said to show an "*integrated camera located above the sensor*" as part of the Baywatch product. That Baywatch includes both a camera and a separate sensor suggests to me that the camera may not be used to detect occupancy, since the only sensor I can see mentioned is the ultrasonic detector. To be clear, I accept that the Baywatch and Car Finder products might in fact use a camera to detect occupancy rather than an ultrasonic detector, it is simply that the extract does not confirm this to me. Consequently there seems to me to be no clear disclosure of "*detecting, by said imaging unit, occupancy of said parking space*" (my emphasis added, note I have construed "*imaging unit*" to mean imaging device or camera in this step, see above). Hence this a difference in the sense of *Windsurfing/Pozzoli* step 3.

37. That the system described in the extract of the prior art document turns off the LED above an occupied parking space and the network monitors spaces available implies to me that the system is "*assigning said parking space, in which said occupancy was detected, an occupied status*" as per step (c). Step (d) in the method is "*obtaining, as a result of said parking space having said occupied status, a single high resolution image of a vehicle occupying said parking space, said high resolution image obtained by said imaging device*". Since page 30 of the prior art document describes the license plate recognition camera as "*continually looking for a licence plate to capture*", it is clear that the Baywatch system described on page 30 captures

an image of a vehicle license plate. This is arguably an "*image of a vehicle*", albeit not of any more of the vehicle than its license plate. What constitutes "*high resolution*" does not seem to be explained in the patent, so I shall assume that "*a resolution of 1280 x 1024*" as disclosed on page 30 meets this requirement. The camera is described on page 30 as "*continually looking*" and there is no link disclosed between the ultrasonic sensors establishing a vehicle is present and the camera obtaining an image. However, the image can only be obtained once a vehicle is present and hence the image is inevitably obtained "*as a result of said parking space having said occupied status*", although there is an argument for saying that "*occupied status*" is a status within the monitoring system, dependent upon the detection at step (b) rather than simply a description that a space is in fact occupied. According to page 30 in the prior art document "*the best image is recorded*" so there is "*storing at least part of said high resolution image*" as step (e) requires.

38. The next step in the method of claim 1 is step (f), "*charging a differential tariff based on a location of said parking space to an owner of said vehicle occupying said parking space*" and I have already said that I take owner to mean customer. I cannot find this step disclosed in the prior art document and the request states that this step is an alternative that would be obvious to a skilled person. This is a further difference between the claim and the prior art document.

39. I take it that "*the ANPR camera begins the process of reading the plate*" on page 30 in the prior art document amounts to "*processing said high resolution image to extract a vehicle identifier of said vehicle from said high resolution image*" from step (g) in claim 1.

40. Also on page 30 it is said that "*A 32" touch screen kiosk is available where the user types the license plate number (or part of) and the car finder will display the exact location of their vehicle including an image of their vehicle in the bay.*". This seems to correspond to the first option of step (h) in claim 1.

41. To recap, the differences that I have identified are "*detecting, by said imaging unit, occupancy of said parking space*" in step (b) and "*charging a differential tariff based on a location of said parking space to an owner of said vehicle occupying said parking space*" in step (f).

42. No argument is offered in the request as to whether it might be obvious to a skilled person to use a camera for detecting occupancy of a parking space. The patent admits that the use of image processing is known in the field and I have taken this to mean commonly known. I said above that I believe the prior art document discloses the use of ultrasonic detectors for detecting occupancy of parking spaces along with cameras and image recognition used for other purposes. It seems to me that using the cameras and image recognition functionality disclosed in the prior art document for the function of detecting parking space occupancy would have been an obvious step for a skilled person, bearing in mind that detection of parking space occupancy is a function of the system described in the prior art document.

43. Regarding the second difference I have identified, the request points to a reference on the page in prior art document following the marked up extract (i.e. page 31 if the pages in the document were numbered) that tariffs may be adjusted "*according to demand*" and argues that it would be obvious to a skilled person to

additionally/alternatively include differential tariffs based upon location. I have nothing to demonstrate that differential pricing based upon parking space location is well known in the art or any other reason that this alternative would have been obvious. Consequently, based upon the information before me, I cannot agree with the argument that changing a differential tariff based upon demand to a differential tariff based upon parking space location would be obvious to a skilled person.

44. Consequently it is my view that claim 1 provides an inventive step over the prior art document.

45. It follows from my conclusion regarding claim 1 that the dependent claims must also be inventive.

46. That leaves claims 10 and 11 which are so-called omnibus claims directed to the description and figures 2 to 12 in the patent. Whilst such claims are often said to be difficult to interpret, my understanding is that they should be construed narrowly. It seems to follow that the scope of such claims cannot be broader than the broadest claim in a patent, i.e. claim 1 in this case. Since it is my view that claim 1 provides an inventive step, it must also follow that claims 10 and 11 are not obvious.

Opinion

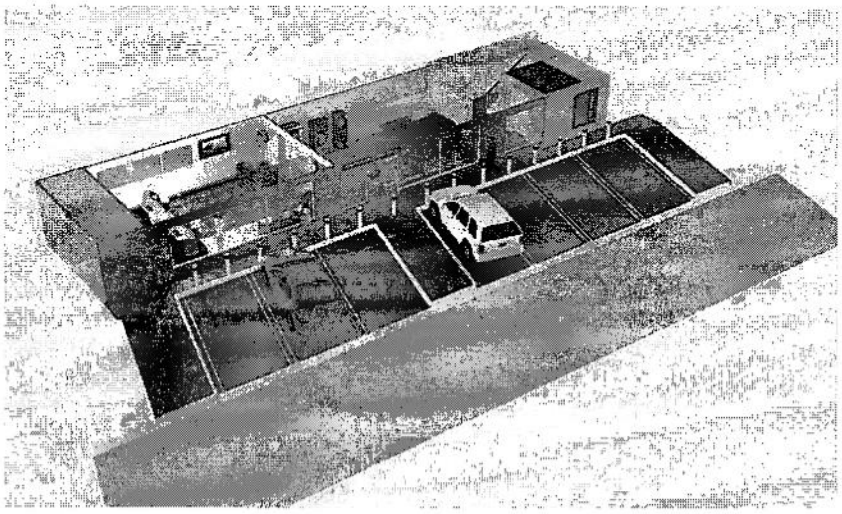
47. In my opinion claim 1 involves an inventive step, based on evidence provided with the request. Specifically, there seems to me to be no clear disclosure in the prior art document of "*charging a differential tariff based on a location of said parking space*" from step (f) in claim 1 and, based on the information in the request, I do not believe that this difference would have been obvious to a person skilled in the art.

Karl Whitfield
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.

D3



A basic design has been put together based on Car Par 4 as an example.

Background Music

The installation of a Music system to provide background music from either radio stations or other stored music device.

Bay Monitoring, Baywatch and Car Finder

The use of bay monitoring is primarily to assist customers to find an available space to park their vehicle quickly without the need to search for a parking space. A bay monitoring system was installed at Heathrow Terminal 5 and has proved successful and popular with users being able to look for a space quickly and more effectively.

The proposed system would include an array of Green LEDs over each vehicle bay. While the vehicle bay is empty the LED array shows green indicating to the driver a space is available. The space detector is monitored by an ultrasonic detector that transmits ultrasonic sound off the floor of the parking bay. When a vehicle moves into the space the ultrasonic detector detects a faster return ultrasonic signal indicating the space is now occupied and turns off the LED display. It is possible for the green LED head to change to red if the client requires but it should be noted that this requires more energy consumption and with observation tests carried out it proved that customers were able to understand the space monitoring system equally well whether the 'no light' or 'red light' were displayed.

The bay monitoring detectors are linked to a single network where spaces available can be monitored with a view of each each parking deck in a 3D viewer displaying all the spaces taken. Various reports and information are also available and would require further discussions to agree a specification. Some of the basic functions are:

- Live spaces display of all car park levels
- Parking duration for each space
- Most popular parking spaces
- Preset time to each bay whereby a different bay colour shows on the display where a vehicle exceeds this period. This can be used to identify possible abandoned vehicles.
- Linked to a Variable Message Sign system. Many VMS systems rely on a count from an induction loop system usually located at the entry and exit lanes to a car park. These count methods are not accurate and require recalibration every two to three days usually by having an operator walk the car park and recount available spaces and then reset

the count system. The bay monitoring system provides a live count of each space in each bay and is therefore more accurate without the need to recalibrate the count information.

- Linked to green/ red LED directional signs the bay monitoring can provide information to directional signs directing vehicles to various levels or sections of a car park or to an individual space.

Baywatch and Car Finder

Baywatch is a new product being developed at the moment and is an extension of the bay monitoring system by providing a car finder system. Baywatch incorporates LPR and CCTV information for each parking bay. When a vehicle parks in a space the green LED light turns off (or changes colour) and an LPR camera captures an image of the vehicle's license plate including a colour image of the vehicle parked. The video runs at 10 frames per second at a resolution of 640x480. Once a vehicle or specifically a license plate is detected the ANPR camera begins the process of reading the plate. Once this has been determined a snapshot of the vehicle is processed and recorded at a resolution of 1280 x 1024 and digitally stored with the bay location. This information is retained on the database and stored for a predetermined length of time. Car finder booths are situated in agreed locations to be used by customers who have forgotten the location of their vehicle. A 32" touch screen kiosk is available where the user types the license plate number (or part of) and the car finder will display the exact bay location of their vehicle including an image of their vehicle in the bay.

The camera image capture is activated by the LPR camera continually looking for a license plate to capture. As a vehicle moves into a space the LPR is looking for a license plate number. Once captured, a number of images are captured and the best image is recorded. Storage space for each image is minimal and no special large storage device is required. Once an LPR is captured and the vehicle is parked further movement of pedestrians or passing vehicles is ignored thus retaining only images of vehicles parked. Bay Watch, like Bay Monitoring, has a graphic display of all vehicle spaces within the car park with the additional LPR and bay location being available.

The software is currently being developed for the Car Finder Kiosk for customer interaction and therefore not available for display. Images below are the back office screens.

Vehicle location screen showing vehicle location after entering the license plate details.