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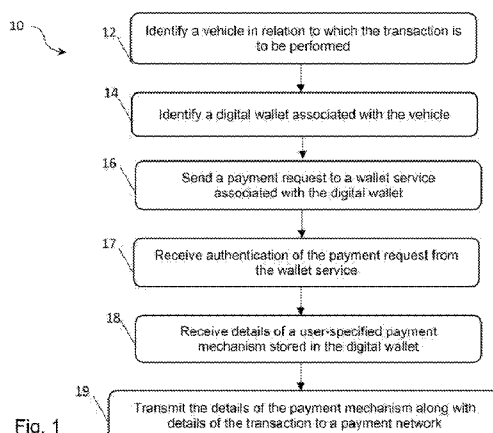


Fig. 1

(57) Abstract: A computer-implemented method is proposed for performing commercial transactions relating to or purchased from a vehicle. The method comprises: a merchant server identifying a vehicle in relation to which the transaction is to be performed and a digital wallet associated with the vehicle and sending a payment request to a wallet service associated with the digital wallet; the merchant server receiving authentication of the payment request from the wallet service and details of a user-specified payment mechanism stored in the digital wallet; and the merchant server transmitting the details of the payment mechanism along with details of the transaction to a payment network to complete the transaction.



METHOD AND SYSTEM FOR PERFORMING COMMERCIAL TRANSACTIONS RELATING TO OR PURCHASED FROM A VEHICLE

CROSS REFERENCE TO RELATED APPLICATION

5 This application claims priority to and the benefit of the filing date of Singapore Application Serial No. 10201508868R, filed October 27, 2015, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

10 The present invention relates to a method and system for performing commercial transactions relating to or purchased from a vehicle.

BACKGROUND

15 Many commercial transactions relating to vehicles take place. For example, the purchasing of fuel, parking charges, toll charges, car insurance, car servicing and speeding and parking infringements. In addition, with the advent of internet-enabled vehicles other goods/service may be purchased from a car such as on-demand car entertainment or in-car concierge services (including, for example, restaurant booking, gift ordering and purchasing of entertainment tickets).

20 There is therefore a need to provide an improved method and system for performing commercial transactions relating to or purchased from a vehicle.

SUMMARY OF THE INVENTION

25 In accordance with a first aspect of the invention there is provided a computer-implemented method for performing commercial transactions relating to or purchased from a vehicle comprising:

- a) a merchant server identifying a vehicle in relation to which the transaction is to be performed;
- b) the merchant server identifying a digital wallet associated with the vehicle;
- 30 c) the merchant server sending a payment request to a wallet service associated with the digital wallet;
- d) the merchant server receiving authentication of the payment request from the wallet service;

- e) the merchant server receiving details of a user-specified payment mechanism stored in the digital wallet; and
- f) the merchant server transmitting the details of the payment mechanism along with details of the transaction to a payment network to complete the transaction.

Embodiments of the present invention have the advantage that payment can be requested directly from a vehicle's associated wallet, without the merchant having to know details of the vehicle owner in order to invoice for the charges incurred. All the merchant needs to do is to identify the vehicle (e.g. by way of a vehicle registration number). It is believed that embodiments of the invention will significantly simplify and accelerate the processing of commercial transactions relating to or purchased from a vehicle as they can be requested electronically in a quick and easy manner at the time the charges are incurred. Conveniently, embodiments of the invention can facilitate all transactions between a vehicle-owner and vehicle-related goods/services.

The wallet service could be a server-side wallet (i.e. set up by the merchant) or a client-side wallet (i.e. set up by the user).

Step f) may be carried out in the form of a business-as-usual transaction whereby the merchant server sends an authorisation request to the payment network via a payment gateway. An acquirer then processes the request and transmits it to an issuer bank associated with the payment mechanism. Once approved by the issuer bank, the payment is transferred to the acquirer for storing in the merchant account.

The payment request may relate to one or more of the following: fuel, parking charges, toll charges, vehicle insurance, vehicle servicing, speeding and parking infringements (or other Police-administered fines); in-vehicle entertainment; and in-vehicle concierge services (including, for example, restaurant booking, gift ordering and purchasing of entertainment tickets).

The vehicle may be identified by one or more of: a vehicle registration number/code; vehicle make and model; year of vehicle registration; vehicle owner details (e.g. name and/or address).

The digital wallet may be configured to receive pre-paid funds (e.g. from an owner's bank account). In this way, the owner may select an amount to pay into the digital wallet (e.g. on an ad hoc, daily, weekly, monthly, quarterly or annual

basis). It is believed that such a system will carry less risk of unauthorised transactions than if the wallet was linked directly to the owner's bank account or credit card, for example, if the vehicle and/or digital wallet were stolen. However, in some embodiments, the digital wallet may be linked to another type of payment mechanism such as a credit card or debit card.

As used in this document, the term "payment card" or "payment mechanism" refers to any suitable cashless payment device, such as a credit card, a debit card, a prepaid card, a charge card, a membership card, a promotional card, a frequent flyer card, an identification card, a gift card, and/or any other device that may hold payment account information, such as mobile phones, Smartphones, personal digital assistants (PDAs), key fobs, transponder devices, NFC-enabled devices, tablets and/or computers.

The digital wallet may be stored in the vehicle. For example, a device may be provided in the vehicle, incorporated into the vehicle as a part thereof or fitted thereto (either on manufacture or during a retro-fit), which comprises the digital wallet associated with the vehicle.

In some embodiments, the digital wallet may alternatively or additionally, be stored on a remote (e.g. cloud) server and accessed via the internet.

The vehicle may be constituted by a car, van, truck, bus, caravan, motorhome, motorbike, bicycle, boat, train, aeroplane, helicopter or other vehicle.

The vehicle may be internet-enabled (i.e. capable of communication over the internet).

In some embodiments, the vehicle may comprise a wireless communication device (e.g. a near-field communication (NFC) device) for communication with a co-operating merchant device. In this way, communication between the vehicle's digital wallet and the merchant server may be direct or through a local area network (LAN) as opposed to over the internet. Such a system may be advantageous for purchases at a fuel station, parking lot or toll gate as well as on-the-spot fines charged by Police officers.

The merchant server may identify the vehicle by any suitable means. For example, the merchant server may identify the vehicle from a database (e.g. in the case of vehicle insurance/servicing companies) or GUI (e.g. for data input by Police officers). In other embodiments, the vehicle may be identified by an optical/electronic reader (e.g. that reads a vehicle registration from a video feed or

that scans a vehicle barcode). In some embodiments, a detector may be used to detect an electronic signal emitted from a vehicle transmitter (e.g. a NFC device such as an RFID tag provided on the vehicle).

5 More specifically, when a vehicle enters an area such as a fuel station, the vehicle registration number may be read electronically as soon as the car enters the area. In other embodiments, a handheld mobile device may be used to initiate a payment (e.g. to request payment for a police ticket the police could have a device to initiate payment from the digital wallet via the internet or a NFC device).

10 Furthermore, service providers (e.g. insurance providers) could bill the vehicle's digital wallet directly over the internet using just the vehicle identification.

The merchant server will therefore identify the vehicle and send a payment request to the digital wallet associated with the vehicle.

When the payment request is received by the digital wallet, an authentication process is initiated.

15 The authentication process may comprise seeking approval of the requested payment from a user of the digital wallet. The user may be the owner of the digital wallet and/or the owner of the vehicle. In some embodiments, the user may be authorised (by the owner of the wallet/vehicle) to make payments from the digital wallet.

20 Approval of the requested payment may be made through a GUI (e.g. on the vehicle or through a smartphone, tablet or computer). The GUI may comprise voice recognition or a retina or fingerprint scan. In other embodiments, a password or PIN may be required to approve the payment.

25 If the approval is granted (i.e. if the user's voice, retina, fingerprint, password or PIN sufficiently matches that stored in the digital wallet and/or in an authentication database), the payment request is authorised and the funds subsequently transferred to the merchant.

30 In some embodiments, the authentication process may comprise checking whether the user wishes to proceed with the transaction or not. For example, in the case of vehicle insurance, the user may decide to change to a different provider and therefore not accept a payment request from their previous provider.

One or more of the steps in the method may require internet communication to/from the vehicle. If the vehicle is not connected to the internet (e.g. because it is out of range) at the time that a step is to be performed, data

associated with the step may be stored in a buffer for subsequent communication when the vehicle is connected to the internet.

In accordance with a second aspect of the invention there is provided a computer system for performing commercial transactions relating to or purchased
5 from a vehicle comprising a processor configured for:

- a) identifying a vehicle in relation to which the transaction is to be performed;
- b) identifying a digital wallet associated with the vehicle;
- c) sending a payment request to a wallet service associated with the digital
10 wallet;
- d) receiving authentication of the payment request from the wallet service;
- e) receiving details of a user-specified payment mechanism stored in the digital wallet; and
- f) transmitting the details of the payment mechanism along with details of
15 the transaction to a payment network to complete the transaction.

The system may further comprise one or more of: a database of vehicle identities; a GUI for a merchant to input a vehicle identity; an optical/electronic reader for identifying a vehicle; or a detector for identifying a vehicle.

The system may further comprise an authentication engine for
20 authenticating the payment request. The authentication engine may be configured to seek approval of the requested payment from a user of the digital wallet; to receive an input from the user; and to verify that the input matches that stored in the digital wallet and/or in an authentication database. The input may comprise the user's voice, retina, fingerprint, password or PIN. The system may therefore further comprise an
25 input device in the form of a GUI (which may comprise a voice recognition device or a retina or fingerprint scanner).

The invention may be implemented in the form of a centralised computer system (e.g. a merchant server) which presents an interface to which users and merchants may connect (e.g. over the internet).

30 The optional method features described above may be implemented using the computer system according to the second aspect of the invention.

In accordance with a third aspect of the invention there is provided a non-transitory computer-readable medium having stored thereon program instructions

for causing at least one processor to perform the method according to the first aspect of the invention.

In accordance with a fourth aspect of the invention there is provided a device comprising a memory having stored therein a digital wallet associated with a vehicle for performing commercial transactions relating to or purchased from the vehicle. The device may be provided in the vehicle and/or located remotely (e.g. as a remote server) that can be connected to over the internet.

In accordance with a fourth aspect of the invention there is provided a vehicle comprising the device according to the fourth aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will now be described, by way of example only, with reference to the following drawings, in which:

Fig. 1 is a flowchart of a computer-implemented method according to an embodiment of the present invention; and

Fig. 2 is a block diagram of a computer system according to an embodiment of the present invention.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

In accordance with an embodiment of the present invention there is provided a computer-implemented method 10 for performing commercial transactions relating to or purchased from a vehicle, as illustrated in Figure 1. In particular, the method comprises a merchant server carrying out the following steps:

Step 12: identify a vehicle in relation to which the transaction is to be performed;

Step 14: identify a digital wallet associated with the vehicle;

Step 16: send a payment request to a wallet service associated with the digital wallet;

Step 17: receive authentication of the payment request from the wallet service;

Step 18: receive details of a user-specified payment mechanism stored in the digital wallet; and

Step 19: transmit the details of the payment mechanism along with details of the transaction to a payment network to complete the transaction.

Figure 2 shows a block diagram of a computer system 20 according to an embodiment of the present invention. The computer system 20 is configured for performing commercial transactions relating to or purchased from a vehicle 21, in accordance with the method described above, and comprises a device including a memory 22 and a merchant server 24. The memory 22 has a digital wallet associated with a vehicle 21 stored thereon while the merchant server 24 is configured for: identifying the vehicle 21 in relation to which the transaction is to be performed; identifying a digital wallet associated with the vehicle 21; sending a payment request to a wallet service 38 associated with the digital wallet; receiving authentication of the payment request from the wallet service 38; receiving details of a user-specified payment mechanism stored in the digital wallet; and transmitting the details of the payment mechanism along with details of the transaction to a payment network 36 to complete the transaction.

More specifically, after the vehicle has been identified, the merchant server 24 may identify the digital wallet associated with the vehicle 21 by looking up the vehicle information in a database. Alternatively, the merchant server 24 may communicate directly with the vehicle 21 to determine details of the digital wallet. For example, the wallet may be incorporated into a device that transmits a near field communication (NFC) signal identifying itself and the server 24 may be connected to an input device configured to receive such a signal and transmit details of the wallet to the server 24. The server may then transmit a signal to a digital wallet service 38 associated with the wallet. The digital wallet service 38 may be provided at the client-side (e.g. as an application installed in the vehicle 21) such that it can be communicated with via NFC or it may be provided at a wallet server-side and communicated with via the internet.

The system further includes an authentication engine 28, operated by the wallet service 38 for authenticating the payment request by seeking approval of the requested payment from a user of the digital wallet 22, receiving an input from the user through an authentication input device 30 and verifying that the input matches that stored in an authentication database 32.

In this case, the authentication input device 30 is in the form of a GUI configured for a user to input their voice through a voice recognition module. However, in other embodiments the user may authenticate a transaction by scanning their retina or fingerprint or by inputting a password or PIN.

Furthermore, in the present embodiment, a merchant input device 34 is provided in the form of an optical reader configured to identify the vehicle 21 so that payment can be requested from the associated digital wallet 22. In other embodiments, the merchant input device 34 may be in the form of a database of vehicle identities; a GUI for a merchant 26 to input a vehicle identity; or a detector configured to identify a vehicle (e.g. from an RFID tag in the vehicle).

Although not shown, the computer system 20 may further comprise a GUI for presenting information to an operator. Furthermore, the computer system 20 may comprise a distributed system with one or more components (e.g. databases) distributed over a network (e.g. the internet). Alternatively, the computer system 20 may comprise a personal computer (PC) or a mobile device, such as a tablet computer or a smartphone.

In the present embodiment, the payment request may arise from a fuel station which identifies the vehicle 21 by scanning its registration plate as it enters the fuel station. The fuel pump will then register the amount of fuel consumption and the associated cost and will make a payment request accordingly to the vehicle's digital wallet which is stored in the vehicle's memory 22. The user (i.e. driver) will then be asked to authenticate the payment using the voice recognition input device 30 in the vehicle 21. The authentication engine 28 will check that the user's voice matches that in the authentication database 32 before permitting the payment to be made from a user-identified payment mechanism stored in the digital wallet 22 to the merchant 26 (i.e. fuel station). In this case, the digital wallet 22 is pre-paid with funds from the user's bank account and the transaction will proceed as long as there are sufficient funds to cover the payment.

For completeness, it should be understood that, once authorised, the transaction will be completed a standard way. For example, the merchant server will send a transaction request to the payment network 36 via a payment gateway. An acquirer will then process the request and transmit it to an issuer bank associated with the payment mechanism identified in the transaction request. Once approved by the issuer bank, the payment will be transferred to the acquirer for storing in the merchant account.

As explained above, embodiments of the present invention have the advantage that commercial transactions relating to or purchased from a vehicle 21 can quickly and easily be initiated by the merchant 26 identifying the vehicle and sending

a payment request to the vehicle's digital wallet 22. However, for security purposes the transaction will only be completed if the user of the digital wallet 22 authorises the payment and this is verified by the system 20.

Although only a single system and method according to embodiments
5 of the present invention have been described in detail, many variations are possible in accordance with the appended claims.

Claims

1. A computer-implemented method for performing commercial transactions relating to or purchased from a vehicle comprising:
 - 5 a) a merchant server identifying a vehicle in relation to which the transaction is to be performed;
 - b) the merchant server identifying a digital wallet associated with the vehicle;
 - c) the merchant server sending a payment request to a wallet service associated with the digital wallet;
 - 10 d) the merchant server receiving authentication of the payment request from the wallet service;
 - e) the merchant server receiving details of a user-specified payment mechanism stored in the digital wallet; and
 - f) the merchant server transmitting the details of the payment mechanism
15 along with details of the transaction to a payment network to complete the transaction.
2. The method according to claim 1 wherein the payment request relates to one or more of the following: fuel, parking charges, toll charges, vehicle insurance, vehicle
20 servicing, speeding infringements, parking infringements; other Police-administered fines; in-vehicle entertainment; and in-vehicle concierge services.
3. The method according to either preceding claim wherein the vehicle is identified by one or more of: a vehicle registration number/code; vehicle make and model; year
25 of vehicle registration; vehicle owner details.
4. The method according to any preceding claim wherein the digital wallet is configured to receive pre-paid funds.
- 30 5. The method according to any preceding claim wherein the digital wallet is linked to at least one payment mechanism.
6. The method according to any preceding claim wherein the digital wallet is stored in the vehicle.

7. The method according to claim 6 wherein a device is provided in the vehicle, incorporated into the vehicle as a part thereof or fitted thereto, which comprises the digital wallet associated with the vehicle.
- 5
8. The method according to any one of claims 1 to 5 wherein the digital wallet is stored on a remote server and accessed via the internet.
9. The method according to any preceding claim wherein the vehicle is constituted
- 10 by a car, van, truck, bus, caravan, motorhome, motorbike, bicycle, boat, train, aeroplane or helicopter.
10. The method according to any preceding claim wherein the vehicle is internet-enabled.
- 15
11. The method according to any preceding claim wherein the vehicle comprises a wireless communication device for communication with a co-operating merchant device.
- 20 12. The method according to any preceding claim wherein the merchant server identifies the vehicle from a database; a GUI; an optical/electronic reader or a detector.
13. The method according to any preceding claim wherein the step of authenticating the payment request comprises seeking approval of the requested payment from a user
- 25 of the digital wallet.
14. The method according to claim 13 wherein approval of the requested payment is made by user input through a GUI.
- 30 15. The method according to claim 14 wherein the GUI comprises voice recognition or a retina or fingerprint scan.
16. The method according to claim 14 wherein the user inputs a password or PIN into the GUI to approve the requested payment.

17. The method according to claim 14 wherein the user input is compared to a reference input stored in the digital wallet and/or in an authentication database and the payment request is authorised when the user input and the reference input are deemed to match.

18. The method according to any preceding claim further comprising checking whether the user wishes to proceed with the transaction or not.

19. The method according to any preceding claim wherein if the vehicle is not connected to the internet at the time that one or more of the method steps are to be performed, data associated with the step(s) is stored in a buffer for subsequent communication when the vehicle is connected to the internet.

20. A computer system for performing commercial transactions relating to or purchased from a vehicle comprising a merchant server configured for:

- a) identifying a vehicle in relation to which the transaction is to be performed;
- b) identifying a digital wallet associated with the vehicle;
- c) sending a payment request to a wallet service associated with the digital wallet;
- d) receiving authentication of the payment request from the wallet service;
- e) receiving details of a user-specified payment mechanism stored in the digital wallet; and
- f) transmitting the details of the payment mechanism along with details of the transaction to a payment network to complete the transaction.

21. The system according to claim 20 further comprising a merchant server input device in the form of one or more of: a database of vehicle identities; a GUI for a merchant to input a vehicle identity; an optical/electronic reader for identifying a vehicle; or a detector for identifying a vehicle.

22. The system according to one of claims 20 or 21 further comprising an authentication engine for authenticating the payment request.

23. The system according to claim 22 wherein the authentication engine is configured to seek approval of the requested payment from a user of the digital wallet; to receive an input from the user; and to verify that the input matches that stored in the digital wallet and/or in an authentication database.

5

24. The system according to claim 23 further comprising an authentication input device in the form of a GUI.

25. The system according to claim 24 wherein the GUI is configured for a user to
10 input their voice, scan their retina or fingerprint or input a password or PIN.

26. A non-transitory computer-readable medium having stored thereon program instructions for causing at least one processor to perform the method according to any one of claims 1 to 19.

15

27. A device comprising a memory having stored therein a digital wallet associated with a vehicle for performing commercial transactions relating to or purchased from the vehicle.

20 28. A vehicle comprising the device according to claim 27.

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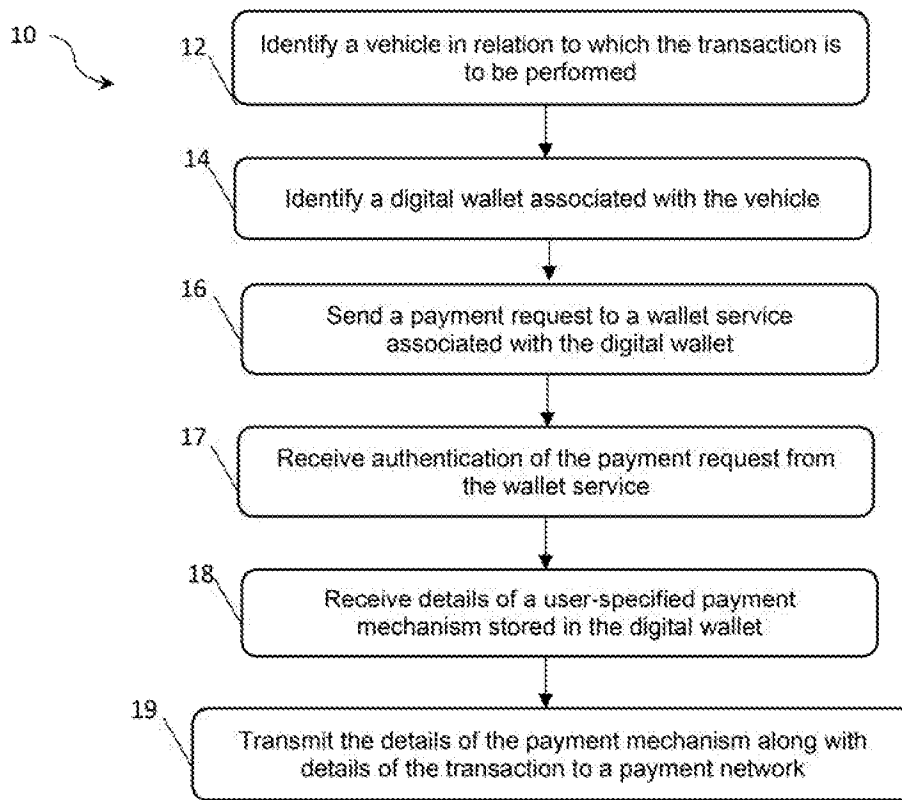


Fig. 1

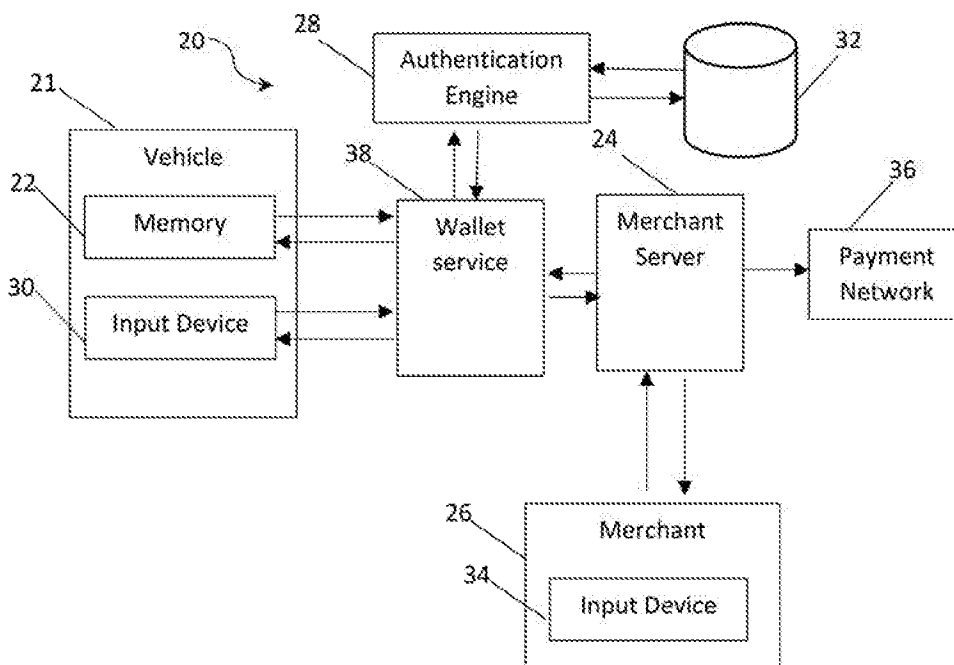


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/057582

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06Q20/00
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)
G06Q

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2015/016929 A1 (INTEL CORP [US]; PRAKASH GYAN [US]; DADU SAURABH [US]; POORNACHANDRAN) 5 February 2015 (2015-02-05) page 2 - page 36; claims 1-20; figures 1-9 -----	1-28
X	US 2015/120472 A1 (AABYE CHRISTIAN [US] ET AL) 30 April 2015 (2015-04-30) paragraph [0031] - paragraph [0062]; claims 1-16; figures 1-8 -----	1-28



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"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

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"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

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Date of the actual completion of the international search

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Name and mailing address of the ISA/

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Authorized officer

Viets, Ana

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/057582

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015016929 A1	05-02-2015	US 2015220916 A1 WO 2015016929 A1	06-08-2015 05-02-2015
US 2015120472 A1	30-04-2015	NONE	