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(54) **Title**: METHODS AND SYSTEMS FOR ENABLING A TEMPORARY USER TO GAIN TEMPORARY ACCESS TO A LOCKED SPACE OF A VEHICLE

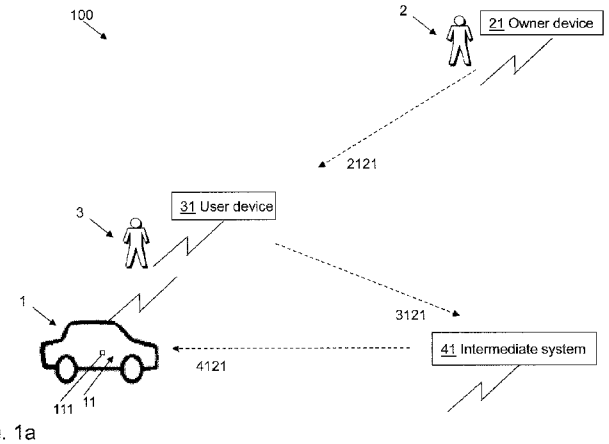


Fig. 1a

(57) **Abstract**: The present disclosure relates to a method performed by an owner device (21) associated with an owner (2) of a vehicle (1), for enabling a temporary user (3) to gain temporary access to a locked space (11) of the vehicle. The vehicle is configured to communicate with an intermediate system (41) adapted to remotely control functionality of the vehicle. The intermediate system is configured to receive, from a user device (31) associated with the temporary user, a request message (3121) to open a remotely operable lock (111) of the locked space and further configured to, based on the request message, transmit an unlock message (4121) to the vehicle to open the lock. The method comprises that the owner device transmits a permission message (2121) comprising access parameters directly or indirectly to the user device. The access parameters are configured to be comprised in the request message to enable the lock to be unlocked based on the access parameters. The disclosure also relates to an owner device in accordance with the foregoing, a user device and a method performed therein, an intermediate system and a method performed therein, a temporary access system and a method performed therein, and a vehicle comprising a remotely operable lock.

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METHODS AND SYSTEMS FOR ENABLING A TEMPORARY USER TO GAIN TEMPORARY ACCESS TO A LOCKED SPACE OF A VEHICLE

TECHNICAL FIELD

The present disclosure relates to enabling a temporary user to gain temporary access to a locked space of a vehicle.

BACKGROUND

Every now and then, the situation occurs when an owner of a vehicle, or at least a person in possession of a conventional or electronic key thereto, is in need of allowing someone else not in possession of such a key, access to the vehicle. Such a scenario may, for instance, arise if a family member or friend needs to pick up, or drop off, something in the vehicle. Another example may be a service provider of a delivered service, such as delivery of a product, e.g. a parcel, goods, dry cleaned clothes, food etc., or delivery of a service, such as a vehicle service, vehicle reconditioning or the like, while the vehicle is parked and locked. Traditionally, the vehicle owner would have to provide the temporary user of the vehicle with a conventional or electronic vehicle key to enable the access thereto. In recent years, however, solutions have been developed which enable access to the vehicle through other means.

US 2014/002236 relates to managing access to physical spaces using door identifying tokens and personal mobile devices as readers, via a network that uses the Internet.

US 8,299,895, for instance, relates to controlling access to an automobile, e.g. by means of a cellular phone. It is disclosed how the cellular phone is mated with the vehicle system and thereafter used to obtain access to the vehicle.

However, although US 8,299,895 suggests a limited function key for a cellular phone for temporary use, and thereby alleviates hassle related to lending a conventional or electronic vehicle key to a temporary user, there still remains uncertainties associated with providing temporary access to the vehicle to a temporary user.

SUMMARY OF THE INVENTION

It is therefore an object of embodiments herein to provide an improved approach of enabling a temporary user to gain temporary access to a vehicle.

According to a first aspect of embodiments herein, the object is achieved by a method performed by an owner device associated with an owner of a vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle. The vehicle is configured to communicate with an intermediate system adapted to remotely control functionality of the vehicle. The intermediate system is configured to receive, from a user device associated with the temporary user, a request message to open a remotely operable lock of the locked space. The intermediate system is further configured to, based on the request message, transmit an unlock message to the vehicle to open the lock. The method comprises that the owner device transmits a permission message comprising access parameters directly or indirectly to the user device. The access parameters are configured to be comprised in the request message to enable the lock to be unlocked based on the access parameters.

Thereby, the access conditions incorporated by the access parameters, which descend from the permission message dictated and transmitted from the owner device to the user device and subsequently to the intermediate system in the request message, are utilized by the intermediate system as underlying conditions for the subsequent provision of the intended temporary access to the locked space. That is, since the access parameters hold access conditions dictated by e.g. the owner via the owner device, and since the access parameters are relayed to the user device via the permission message, and subsequently relayed, e.g. on initiation of the temporary user, to the intermediate system, the intermediate system may take into consideration the access conditions as defined by the access parameters in the subsequent unlocking/locking of the remotely operable lock.

Accordingly, there is provided a solution according to which uncertainties commonly associated with allowing a temporary user temporary access to a vehicle, are alleviated.

Furthermore, an approach is suggested according to which the owner may set up his or her own access conditions as considered suitable for the specific intended temporary access in question.

For that reason, there is provided an improved approach of enabling a temporary user to gain temporary access to a vehicle.

The technical features and corresponding advantages of the above mentioned method will be discussed in further detail in the following.

By introducing a method performed by an owner device associated with an owner of a vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle, an approach is provided which enables for an owner of a vehicle to allow someone else, not in possession of a key thereto, a restricted and/or conditioned access to the vehicle of the owner. The referred to "vehicle" may be any arbitrary vehicle, for instance a car, truck, lorry, van, bus, tractor, military vehicle, air plane, or vessel. Furthermore, the "owner" of the vehicle is intended to be interpreted in a broad manner, likewise referring to any arbitrary person accountable for the vehicle, or a person in possession of "constant" or "continuous" access rights to remotely control, such as unlock, the vehicle.

The "temporary user" of the vehicle is, in a similar manner, intended to be interpreted in a broad manner, likewise referring to someone to whom it is intended to provide conditional access to a locked space of the vehicle. The temporary user may hence refer to e.g. a family member or a friend. Additionally or alternatively, the temporary user may refer to a service provider being trusted to provide a delivered service while the vehicle is parked and locked, such as delivery of a product, e.g. a parcel, goods, dry cleaned clothes, food etc., or a delivery of service, such as e.g. a vehicle service, vehicle reconditioning or the like. Furthermore, the "temporary access" is intended to refer to the temporary user being allowed access to the locked space, which access is restricted by conditions, e.g. regarding access time frame and/or number of times being allowed access.

The referred to "owner device" may be any arbitrary electronic unit which is capable of communicating with other units, and which is adapted to provide a software tool via which conditions for an intended provision of a temporary access to the vehicle may be dictated.

The owner device may hence, for instance, be represented by a stationary computer or a mobile user equipment, for instance a mobile terminal or wireless terminal, a mobile phone or smart phone, a computer such as e.g. a laptop, a Personal Digital Assistant (PDA) or tablet computer, sometimes referred to as a surf plate, with wireless capability, or for example, a portable, pocket-storable, hand-held, computer-comprised mobile device. Furthermore, "associated with" is throughout this disclosure intended to be interpreted to likewise include e.g. "in possession of", "carried by", and "used by".

Since the vehicle is configured to communicate with an intermediate system adapted to remotely control functionality of the vehicle, a locked space of the vehicle may, for instance, be unlocked or locked, following instructions submitted from the intermediate system. Utilizing the intermediate system enables for updated instructions to override previous instructions, such as for instance cancelling of a previous instruction to allow a temporary access to the vehicle. The intermediate system may refer to any arbitrary assisting and/or managing system, such as a remotely located server, allowed to and adapted for remotely controlling functionality of the vehicle, such as providing access thereto. The intermediate system may for instance be represented by a Volvo On Call system. The vehicle may be adapted to communicate with the intermediate system as commonly known in the art, for instance via a wireless network.

Since the intermediate system is configured to receive, from a user device associated with the temporary user, a request message to open a remotely operable lock of the locked space, the user device may, for instance by initiation of the temporary user, be adapted to submit a request for the intermediate system to remotely open the lock of the locked space of the vehicle. By the lock being "remotely operable" is here intended to indicate that the lock may be controlled to be unlocked or locked from a far distance, i.e. from the remotely arranged intermediate server. The remotely operable lock may for instance be represented by one or a combination of a vehicle door lock, trunk lock, engine hood lock, fuel lid lock or a lock to an isolated section of the vehicle, e.g. a separate compartment through which the interior body of the vehicle may not be reached. For instance, allowing temporary access to the engine hood, fuel lid and/or body may enable a vehicle mechanics to perform e.g. a vehicle service, vehicle reconditioning or the like. In addition thereto, subsequent being allowed access to the locked space, the temporary user may further be given access to e.g. start the engine, or access data of the vehicle. Similarly, allowing temporary access to the body, trunk and/or isolated section may enable e.g. a

family member or friend to pick up, or drop off, something in the vehicle, or e.g. a service provider to deliver a product, e.g. a parcel, goods, dry cleaned clothes, food etc. while the vehicle is parked and initially locked.

The lock may further, according to an example, comprise - or be in communication with a unit providing - functionality which allows for detection and/or storage of events related to access given to the lock, or opening/closing of a door, hatch, lid etc. associated with the lock. Thereby, tracking of events related to the lock may be enabled.

The referred to "user device" may be any arbitrary electronic unit which is capable of communicating with other units, and which is adapted to provide, e.g. compose, and transmit a request message to the intermediate system. The user device may hence, for instance, be represented by a stationary computer or a mobile user equipment, for instance a mobile terminal or wireless terminal, a mobile phone or smart phone, a computer such as e.g. a laptop, a Personal Digital Assistant (PDA) or tablet computer, sometimes referred to as a surf plate, with wireless capability, or for example, a portable, pocket-storable, hand-held, computer-comprised mobile device. Furthermore, as previously indicated, "associated with" is throughout this disclosure intended to be interpreted in a broad manner, likewise including e.g. "in possession of", "carried by", and "used by".

The referred to "request message" to open the lock may be represented by any arbitrary type of message supported in the communication between the user device and the intermediate system. The request message may hence be comprised in a generic message format or a message of customized format, and e.g. represented by a push message.

Since the intermediate system is further configured to, based on the request message, transmit an unlock message to the vehicle to open the lock, the intermediate system may instruct the vehicle to unlock the lock under the conditions being indicated by the content of the request message. The referred to "unlock message" to open the lock may be represented by any arbitrary type of message supported in the communication between the intermediate system and the vehicle. The unlock message may hence be comprised in a generic message format or a message of customized format, as known in the art.

Furthermore, "based on" is throughout this disclosure intended to be interpreted to likewise include at least "utilizing", "considering" and "taking into account".

Since the owner device transmits a permission message comprising access parameters directly or indirectly to the user device, the owner device may, supposedly by initiation of the owner, submit a message to the user device indicating conditions under which temporary access the locked space may be allowed. Thereby, access conditions for the intended specific temporary access at hand may be dictated as suitable or preferred by the owner. The referred to "access parameters" may be represented by any arbitrary parameters indicating conditions of the intended provision of temporary access, relating for instance to access timing and vehicle identity.

The "permission message" may be transmitted directly from the owner device to the user device, or, alternatively, for instance indirectly via the intermediate system to the user device. The permission message may, in the latter case, to some extent be amended in the intermediate system to suit a possible differing communication format between the intermediate system and the user device, as compared to the communication format between the owner device and the intermediate system. Furthermore, the permission message may, should it be routed via the intermediate system, be amended in the intermediate system to comprise a subset of the content of the permission message, or amended to comprise an extension thereof prior to being transmitted to the user device.

Furthermore, the "permission message" may be represented by any arbitrary type of message supported in the communication between the owner device and the user device, and possible the intermediate system. The permission message may hence be comprised in a generic message format or a message of customized format, and e.g. represented by a push message. According to one example, the owner device is e.g. a smart phone provided with a vehicle control application, i.e. an "app", such as e.g. the commonly known Volvo On Call app, enabling control of functionality of the vehicle via the intermediate system. The vehicle control app may be adapted to provide the owner device, and subsequently the owner, with a software tool via which conditions for an intended provision of a temporary access to the vehicle may be dictated, which conditions subsequently may be embedded in a permission message and submitted to the user device.

Since the access parameters are configured to be comprised in the request message to enable the lock to be unlocked based on the access parameters, the access conditions incorporated by the access parameters, which descend from the permission message dictated and transmitted from the owner device, are utilized by the intermediate server as underlying conditions for the subsequent provision of temporary access to the locked space. That is, since the access parameters hold access conditions dictated by e.g. the owner via the owner device, and since the access parameters are relayed to the user device via the permission message, and subsequently relayed, e.g. on initiation of the temporary user, to the intermediate system, the intermediate system may take into consideration the access conditions as defined by the access parameters in the subsequent unlocking/locking of the lock. Accordingly, an owner of a vehicle may, via an owner device, dictate access conditions for a temporary user, which access conditions are submitted, via the user device, to the temporary user, which access conditions subsequently may be submitted to the intermediate system to thereby constitute a basis for the provision of the temporary access of the locked space as provided by the intermediate system.

According to an embodiment, the permission message may comprise a user selectable web link connecting to the remote intermediate system, which web link is adapted to, upon being selected, initiate the request message to be transmitted to the intermediate system. Thereby, when the web link is selected, supposedly by the temporary user, a web interface associated with the web link provides a means for the temporary user to instruct the intermediate system to follow through on the enabling of the intended temporary access. That is, transmission of the request message may here be represented by the web link being selected and subsequently the intended temporary access being confirmed, supposedly by the temporary user, via the web interface. The referred to “web link” may for instance be represented by a http address. Furthermore, the web link “connecting to the intermediate system” may indicate an input port to the intermediate system.

According to one embodiment, the permission message may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message. Thereby, a generic, commonly implemented message format may be utilized

for submission of the permission message. The referred to "corresponding type" may refer to a message of a generic format, or a message of a customized format.

According to another embodiment, the access parameters may comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters. Thereby, access conditions in terms of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters for the intended specific temporary access may be dictated as suitable or preferred by the owner. "Vehicle identification parameters" may comprise parameters indicating the identity of the vehicle in question, whereas "time frame parameters" may comprise parameters indicating for instance a temporary access start time and/or end time, a temporary access duration restriction, and/or a temporary access time window. Furthermore, "location parameters" may comprise parameters indicating a vehicle location restriction, i.e. that the vehicle in question may need to be located in a specific area for allowing temporary access, or a corresponding temporary user location restriction, whereas "recurrence parameters" may comprise parameters indicating a number of times temporary access is allowed. Further parameters, such as e.g. identity of the owner, are likewise feasible.

According to yet another embodiment, the owner device may transmit a verification message to the intermediate system, which verification message comprises verification parameters corresponding to the access parameters. The unlock message is adapted to additionally be based on the verification message, to enable the lock to be unlocked additionally based on the verification parameters. Thereby, by the owner device submitting a verification message to the intermediate system, in addition to submitting the permission message to the user device, the intermediate system is enabled to consider the verification parameters of the verification message prior to following through on the requested temporary access. Accordingly, the intermediate system may perform an additional safety check in comparing the verification parameters to the access parameters.

The unlock message being adapted to "additionally be based on" the verification parameters, and the lock being enabled to be unlocked "additionally based on" the verification parameters, is here hence intended to indicate that the intermediate system takes the verification parameters into account in addition to the access parameters.

The referred to "verification message" may be represented by any arbitrary type of message supported in the communication between the owner device and the intermediate system. The verification message may hence be comprised in a generic message format or a message of customized format, as known in the art. The verification message may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message, such as for instance a message of a generic format or a message of a customized format according to which the owner device may communicate with the intermediate system.

Furthermore, the referred to "verification parameters" may be represented by any arbitrary parameters indicating conditions of the intended provision of temporary access. That is, the verification parameters may comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters. Furthermore, the verification parameters may comprise a subset of the access parameters, and/or further parameters applicable to indicate the framing of the intended, subsequent, temporary access provision. The verification parameters "corresponding to" the access parameters, is here intended to be interpreted to likewise include e.g. "being associated with", "being similar to", and "comprising a subset or an extension of".

According to yet another embodiment, the locked space may be one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle. Thereby, different parts of the vehicle, which respectively are provided with one or several remotely operable locks, may come in question for the temporary access. The locked space being a "body" of the vehicle is here intended to indicate the passenger compartment of the vehicle, i.e. the interior of the vehicle, to which access may be restricted by one or several vehicle doors. The locked space being an "isolated section" of the vehicle may refer to e.g. a separate compartment comprised in the vehicle, through which the interior body of the vehicle cannot be reached.

According to a second aspect of embodiments herein, the object is achieved by a method performed by a user device associated with a temporary user, for enabling the temporary user to gain temporary access to a locked space of a vehicle. The vehicle is configured to communicate with an intermediate system adapted to remotely control functionality of the vehicle. The intermediate system is configured to transmit an unlock message to the

vehicle to open a remotely operable lock of the locked space. The method comprises that the user device receives a permission message directly or indirectly from an owner device associated with an owner of the vehicle, which permission message comprises access parameters. The user device furthermore transmits a request message to open the lock, to the intermediate system. The request message comprises the access parameters, whereby the unlock message is adapted to be based on the request message to enable the lock to be unlocked based on the access parameters.

According to an embodiment, the unlock message may further be adapted to additionally be based on a verification message configured to be transmitted from the owner device to the intermediate system. The verification message comprises verification parameters corresponding to the access parameters, wherein the lock is enabled to be unlocked additionally based on the verifications parameters.

According to yet another embodiment, the permission message may comprise a user selectable web link connecting to the remote intermediate system, wherein transmitting the request message comprises the web link being selected.

According to one embodiment, the permission message may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

According to another embodiment, the access parameters may comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

According to yet another embodiment, the locked space may be one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle.

Similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the second aspect, why these advantages are not further discussed.

According to a third aspect of embodiments herein, the object is achieved by a method performed by an intermediate system adapted to remotely control functionality of a

vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle. The intermediate system is configured to directly or indirectly communicate with an owner device associated with an owner of the vehicle. The owner device is configured to transmit a permission message comprising access parameters directly or indirectly to a user device associated with the temporary user. The method comprises that the intermediate system receives a request message to open a remotely operable lock of the locked space from the user device, which request message comprises the access parameters. The intermediate system furthermore transmits, based on the request message, an unlock message to the vehicle to open the lock, whereby the lock is enabled to be unlocked based on the access parameters.

According to an embodiment, the permission message may comprise a user selectable web link connecting to the remote intermediate system. The web link is adapted to, upon being selected, initiate the request message to be transmitted to the intermediate system.

According to another embodiment, the intermediate system may further receive a verification message from the owner device, which verification message comprises verification parameters corresponding to the access parameters. The unlock message is adapted to additionally be based on the verification message, to enable the lock to be unlocked additionally based on the verification parameters.

According to one embodiment, the permission message may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

According to another embodiment, the access parameters may comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

According to yet another embodiment, the locked space may be one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle.

Yet again, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the third aspect, why these advantages are not further discussed.

According to a fourth aspect of embodiments herein, the object is achieved by a method performed by a temporary access system comprising an owner device, a user device and an intermediate system, for enabling a temporary user to gain temporary access to a locked space of a vehicle. The temporary access system performs the actions of the owner device discussed in the foregoing, the actions of the previously discussed user device, and the actions of the intermediate system discussed in the foregoing. Once more, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the fourth aspect, why these advantages are not further discussed.

According to a fifth aspect of embodiments herein, the object is achieved by an owner device adapted to be associated with an owner of a vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle. The vehicle is configured to communicate with an intermediate system adapted to remotely control functionality of the vehicle. The intermediate system is configured to receive, from a user device associated with the temporary user, a request message to open a remotely operable lock of the locked space and further configured to, based on the request message, transmit an unlock message to the vehicle to open the lock. The owner device comprises an owner transmitting unit adapted for transmitting a permission message comprising access parameters directly or indirectly to the user device. The access parameters are configured to be comprised in the request message to enable the lock to be unlocked based on the access parameters. Again, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the fifth aspect, why these advantages are not further discussed.

According to a sixth aspect of embodiments herein, the object is achieved by a user device adapted to be associated with a temporary user, for enabling the temporary user to gain temporary access to a locked space of a vehicle. The vehicle is configured to communicate with an intermediate system adapted to remotely control functionality of the vehicle. The intermediate system is configured to transmit an unlock message to the vehicle to open a remotely operable lock of the locked space. The user device comprises a user receiving unit adapted for receiving a permission message directly or indirectly from an owner device associated with an owner of the vehicle, which permission message comprises access parameters. The user device further comprises a user transmitting unit

adapted for transmitting a request message to open the lock, to the remote intermediate system, wherein the request message comprises the access parameters. The unlock message is adapted to be based on the request message to enable the lock to be unlocked based on the access parameters. Once more, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the sixth aspect, why these advantages are not further discussed.

According to a seventh aspect of embodiments herein, the object is achieved by an intermediate system adapted to remotely control functionality of a vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle. The intermediate system is configured to directly or indirectly communicate with an owner device associated with an owner of the vehicle. The owner device is configured to transmit a permission message comprising access parameters directly or indirectly to a user device associated with the temporary user. The intermediate system comprises an intermediate receiving unit adapted for receiving a request message to open a remotely operable lock of the locked space from the user device, which request message comprises the access parameters. The intermediate system further comprises an intermediate transmitting unit adapted for transmitting, based on the request message, an unlock message to the vehicle to open the lock, whereby the lock is enabled to be unlocked based on the access parameters. Yet again, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the seventh aspect, why these advantages are not further discussed.

According to an eight aspect of embodiments herein, the object is achieved by a temporary access system adapted for enabling a temporary user to gain temporary access to a locked space of a vehicle. The temporary access system comprises the owner device discussed in the foregoing, the previously discussed user device, and the intermediate system discussed in the foregoing. Once more, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the eight aspect, why these advantages are not further discussed.

According to a ninth aspect of embodiments herein, the object is achieved by a vehicle comprising a remotely operable lock of a locked space of the vehicle, which vehicle is adapted for enabling a temporary user to gain temporary access to the locked space. The vehicle is configured to communicate with an intermediate system adapted to remotely

control functionality of the vehicle. The intermediate system is configured to directly or indirectly communicate with an owner device associated with an owner of the vehicle. The owner device is adapted for transmitting a permission message comprising access parameters directly or indirectly to a user device associated with the temporary user The user device is adapted for transmitting a request message to open the lock, to the remote intermediate system, which request message is configured to comprise the access parameters. The vehicle is adapted to receive, from the intermediate system, based on the request message, an unlock message to open the lock, whereby the lock is enabled to be unlocked based on the access parameters. Yet again, similar advantages as those mentioned in the foregoing in relation to the first aspect correspondingly apply to the ninth aspect, why these advantages are not further discussed.

BRIEF DESCRIPTION OF THE DRAWINGS

The various aspects of the non-limiting embodiments of the invention, including particular features and advantages, will be readily understood from the following detailed description and the accompanying drawings, in which:

Figure 1a illustrates an exemplifying temporary access system for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to embodiments of the disclosure;

Figure 1b illustrates an exemplifying temporary access system for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to alternative embodiments of the disclosure;

Figure 1c illustrates an exemplifying temporary access system for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to yet other embodiments of the disclosure;

Figure 2 is a schematic block diagram illustrating a temporary access system according to embodiments of the disclosure;

Figure 3 is a flowchart depicting an exemplifying method performed by an electronic owner device associated with an owner of a vehicle, for enabling a temporary user to gain

temporary access to a locked space of the vehicle, according to embodiments of the disclosure;

Figure 4 is a flowchart depicting an exemplifying method performed by an electronic user device associated with a temporary user, for enabling the temporary user to gain temporary access to a locked space of a vehicle, according to embodiments of the disclosure;

Figure 5 is a flowchart depicting an exemplifying method performed by an electronic intermediate system adapted to remotely control functionality of a vehicle, for enabling a temporary user to gain temporary access to a locked space of the vehicle, according to embodiments of the disclosure;

Figure 6 is a flowchart depicting an exemplifying method performed by a temporary access system, for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to embodiments of the disclosure; and

Figure 7 illustrates an exemplifying signal flow diagram of a temporary access system according to embodiments of the disclosure.

DETAILED DESCRIPTION

The non-limiting embodiments of the present disclosure will now be described more fully hereinafter with reference to the accompanying drawings, in which currently preferred embodiments of the disclosure are shown. This disclosure may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Like reference characters refer to like elements throughout. Dashed lines of some boxes in the figures indicate that these units or actions are optional and not mandatory.

In the following, according to embodiments herein which relate to enabling a temporary user to gain temporary access to a locked space of a vehicle, there will be disclosed how access conditions incorporated by access parameters, which descend from a permission message dictated and transmitted from an owner device to a user device and subsequently to an intermediate system in a request message, may be utilized by the

intermediate system as underlying conditions for a subsequent provision of temporary access to the locked space.

Referring now to the figures and **Figure 1a** in particular, there is depicted an exemplifying **temporary access system 100** for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to embodiments of the disclosure.

In the illustrated embodiment of Figure 1a, there is depicted a **vehicle 1**, here a car. The vehicle 1 comprises a **remotely operable lock 111** of a **locked space 11** of the vehicle 1. The locked space 11 is here represented by the interior space of the vehicle 1 itself, i.e. the body of the vehicle 1. According to alternative embodiments, however, the locked space 11 may be represented by one or a combination of the body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle 1. The remotely operable lock 111 is here represented by one, or several, of the door locks of the vehicle 1.

The vehicle 1 is adapted for enabling a **temporary user 3** to gain temporary access to the locked space 11. The temporary user 3 is represented by a person whom may be given access to the locked space 11, here to the interior space of the vehicle 1, during a restricted period of time. The vehicle 1 is further configured to communicate with an **intermediate system 41** adapted to remotely control functionality of the vehicle 1. The intermediate system 41 is according to the embodiment of Figure 1a represented by an adapted management and/or assisting system, such as e.g. Volvo On Call.

Furthermore, the intermediate system 41 is configured to directly or indirectly communicate with an **owner device 21** associated with an **owner 2** of the vehicle 1. The owner 2 is here represented by a person having "continuous", rather than temporary, access to the vehicle, and the owner device 21 is her represented by an adapted smart phone. The owner device 21 has, according to the embodiment of Figure 1a, installed thereon functionality such as a vehicle control application, i.e. an "app", such as e.g. a Volvo On Call app, enabling control of functionality of the vehicle 1 by communicating with the intermediate system 41.

The owner device 21 is adapted for transmitting a **permission message 2121** comprising access parameters directly or indirectly to a **user device 31** associated with the temporary user 3. The permission message 2121 may be comprised in at least one Short

Message Service, SMS, message, at least one email and/or a corresponding type of message. A corresponding type of message may for instance be a message of a generic format, or a message of a customized format according to which the owner device 21 may communicate with the user device 31. Here, the permission message 2121 is represented by an SMS, which may be generated by the owner 2 selecting settings via the vehicle control app, and which subsequently may lead to giving the temporary user 3 temporary access to the vehicle 1. The access parameters of the illustrated embodiment comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

The user device 31 is here represented by a smart phone having functionality enabling for communication with other electronic devices. The user device 31 is adapted for transmitting a **request message 3121** to open the lock 111, to the remote intermediate system 41, which request message 3121 is configured to comprise the access parameters. Correspondingly, the intermediate system 41 is configured to receive the request message 3121.

The request message 3121 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message, such as for instance a message of a generic format or a message of a customized format according to which the user device 31 may communicate with the intermediate system 41. However, according to the embodiment of Figure 1a, the permission message 2121 comprises a user selectable web link connecting to the remote intermediate system 41, which web link is adapted to, upon being selected, initiate the request message 3121 to be transmitted to the intermediate system 41. Thus, in the shown embodiment, the temporary user 3 may, by selecting, on the user device 31, the web linked incorporated in the permission message 3121, be redirected to e.g. a web interface associated with the intermediate system 41, via which web interface the temporary user 3 may confirm to the intermediate system 41 the request for the intended temporary access. The request message 3121 may hence here be represented by the temporary user 3, subsequent being redirected to the web interface, selecting an option provided by the web interface to carry out opening of the lock 111, as dictated by the access parameters.

Furthermore, the vehicle 1 is adapted to receive, from the intermediate system 41, based on the request message 3121, an **unlock message 4121** to open the lock 111, whereby

the lock 111 is enabled to be unlocked based on the access parameters. Correspondingly, the intermediate system 41 is configured to, based on the request message 3121, transmit the unlock message 4121 to the vehicle 1 to open the lock 111. The unlock message 4121 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message, such as for instance a message of a generic format or a message of a customized format according to which the intermediate system 41 may communicate with the vehicle 1.

Figure 1b illustrates an exemplifying temporary access system for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to alternative embodiments of the disclosure. The embodiment of Figure 1b is similar to that of Figure 1a, with the difference of an additional optional **verification message 2122** provided by the owner device 21 to the intermediate system 41.

That is, the owner device 21 is configured to transmit a verification message 2122 to the intermediate system 41, which verification message 2122 comprises verification parameters corresponding to the access parameters, whereby the unlock message 4121 is adapted to additionally be based on the verification message 2122, to enable the lock 111 to be unlocked additionally based on the verification parameters. Correspondingly, the intermediate system 41 is configured to receive the verification message 2122 from the owner device 21.

The verification message 2122 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message, such as for instance a message of a generic format or a message of a customized format according to which the owner device 21 may communicate with the intermediate system 41. Furthermore, the verification parameters may, in a similar manner to the access parameters, comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters. Furthermore, the verification parameters may comprise a subset of the access parameters, and/or further parameters applicable to indicate the framing of the intended, subsequent, temporary access provision.

Figure 1c illustrates an exemplifying temporary access system for enabling a temporary user to gain temporary access to a locked space of a vehicle, according to yet other embodiments of the disclosure. The embodiment of Figure 1c is similar to that of Figure 1a, with the difference being an alternative optional communication path of the permission message 2121 from the owner device 21 to the user device 31.

That is, in the embodiment of Figure 1c, the permission message 2121 of Figure 1a is adapted to be transmitted via the intermediate system 41. The permission message 2121 is hence represented by a **first message 2123** submitted from the owner device 21 to the intermediate system 41, and a **second message 4122** submitted from the intermediate system 41 to the vehicle 1. The second message 4122 is here essentially identical to the first message 2123; however, according to alternative embodiments, the second message 4122 may comprise a subset of the first message 2123, and/or be expanded to comprise further parameters applicable to indicate the framing of the intended temporary access.

As further shown in **Figure 2**, which depicts a schematic block diagram illustrating the exemplifying temporary access system 100 according to embodiments of the disclosure, the temporary access system 100 is adapted for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, and comprises the owner device 21, the user device 31 and the intermediate system 41. The temporary access system 100 may further optionally comprise the remotely operable lock 111.

The owner device 21 comprises an **owner transmitting unit 212** adapted for transmitting the permission message 2121 comprising the access parameters directly or indirectly to the user device 31. Furthermore, the embodiments herein for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, may be implemented through one or more processors, such as a **processor 213**, here denoted CPU, together with computer program code for performing the functions and actions of the embodiments herein. Said program code may also be provided as a computer program product, for instance in the form of a data carrier carrying computer program code for performing the embodiments herein when being loaded into the owner device 21. One such carrier may be in the form of a CD ROM disc. It is however feasible with other data carriers such as a memory stick. The computer program code may furthermore be provided as pure program code on a server and downloaded to the owner device 21.

The owner device 21 may further comprise a **memory 214** comprising one or more memory units. The memory 214 may be arranged to be used to store e.g. information, and further to store data, configurations, schedulings, and applications, to perform the methods herein when being executed in the owner device 21. Furthermore, the owner transmitting unit 212, the processor 213, and the memory 214 may for instance be implemented in one or several arbitrary electronic devices having communication capabilities. Those skilled in the art will also appreciate that the owner transmitting unit 212 described above, and which will be described in more detail later on in this description, may refer to a combination of analog and digital circuits, and/or one or more processors configured with software and/or firmware, e.g. stored in a memory such as the memory 214, that when executed by the one or more processors such as the processor 213 perform as will be described in more detail later on. One or more of these processors, as well as the other digital hardware, may be included in a single ASIC (Application-Specific Integrated Circuitry), or several processors and various digital hardware may be distributed among several separate components, whether individually packaged or assembled into a SoC (System-on-a-Chip).

The user device 31 comprises a **user receiving unit 311** adapted for receiving the permission message 2121 directly or indirectly from the owner device 21, and a **user transmitting unit 312** adapted for transmitting the request message 3121 to open the lock 111 to the remote intermediate system 41. Furthermore, the embodiments herein for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, may be implemented through one or more processors, such as a **processor 313**, here denoted CPU, together with computer program code for performing the functions and actions of the embodiments herein. Said program code may also be provided as a computer program product, for instance in the form of a data carrier carrying computer program code for performing the embodiments herein when being loaded into the user device 31. One such carrier may be in the form of a CD ROM disc. It is however feasible with other data carriers such as a memory stick. The computer program code may furthermore be provided as pure program code on a server and downloaded to the user device 31.

The user device 31 may further comprise a **memory 314** comprising one or more memory units. The memory 314 may be arranged to be used to store e.g. information, and further

to store data, configurations, schedulings, and applications, to perform the methods herein when being executed in the user device 31. Furthermore, the user receiving unit 311 and the user transmitting unit 312, the processor 313, and the memory 314 may for instance be implemented in one or several arbitrary electronic devices having communication capabilities. Those skilled in the art will also appreciate that the user receiving unit 311 and the user transmitting unit 312 described above, and which will be described in more detail later on in this description, may refer to a combination of analog and digital circuits, and/or one or more processors configured with software and/or firmware, e.g. stored in a memory such as the memory 314, that when executed by the one or more processors such as the processor 313 perform as will be described in more detail later on. One or more of these processors, as well as the other digital hardware, may be included in a single ASIC (Application-Specific Integrated Circuitry), or several processors and various digital hardware may be distributed among several separate components, whether individually packaged or assembled into a SoC (System-on-a-Chip).

The intermediate system 41 comprises an **intermediate receiving unit 411** adapted for receiving the request message 3121 to open the remotely operable lock 111 from the user device 31, and an **intermediate transmitting unit 412** adapted for transmitting, based on the request message 3121, the unlock message 4121 to the vehicle 1 to open the lock 111. Furthermore, the embodiments herein for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, may be implemented through one or more processors, such as a **processor 413**, here denoted CPU, together with computer program code for performing the functions and actions of the embodiments herein. Said program code may also be provided as a computer program product, for instance in the form of a data carrier carrying computer program code for performing the embodiments herein when being loaded into the intermediate system 41. One such carrier may be in the form of a CD ROM disc. It is however feasible with other data carriers such as a memory stick. The computer program code may furthermore be provided as pure program code on a server and downloaded to the intermediate system 41.

The intermediate system 41 may further comprise a **memory 414** comprising one or more memory units. The memory 414 may be arranged to be used to store e.g. information, and further to store data, configurations, schedulings, and applications, to perform the methods herein when being executed in the intermediate system 41. Furthermore, the intermediate receiving unit 411 and the intermediate transmitting unit 412, the processor

413, and the memory 414 may for instance be implemented in a management and/or assisting system adapted to remotely control functionality of the vehicle 1. Those skilled in the art will also appreciate that the intermediate receiving unit 411 and the intermediate transmitting unit 412 described above, and which will be described in more detail later on in this description, may refer to a combination of analog and digital circuits, and/or one or more processors configured with software and/or firmware, e.g. stored in a memory such as the memory 414, that when executed by the one or more processors such as the processor 413 perform as will be described in more detail later on. One or more of these processors, as well as the other digital hardware, may be included in a single ASIC (Application-Specific Integrated Circuitry), or several processors and various digital hardware may be distributed among several separate components, whether individually packaged or assembled into a SoC (System-on-a-Chip).

Figure 3 is a flowchart depicting an exemplifying method performed by the owner device 21 associated with the owner 2 of the vehicle 1, for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, according to embodiments of the disclosure. The exemplifying method, which may be continuously repeated, comprises the following actions discussed with support from Figures 1 and 2. The actions may be taken in any suitable order, or even simultaneously.

The vehicle 1 is configured to communicate with the intermediate system 41 adapted to remotely control functionality of the vehicle 1. The intermediate system 41 is configured to receive, from the user device 31 associated with the temporary user 3, the request message 3121 to open the remotely operable lock 111 of the locked space 11 and further configured to, based on the request message 3121, transmit the unlock message 4121 to the vehicle 1 to open the lock 111.

Optionally, the locked space 11 is one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle 1.

Action 1001

In Action 1001, the owner device 21 transmits, by means of the owner transmitting unit 212, the permission message 2121 comprising access parameters directly or indirectly to the user device 31, wherein the access parameters are configured to be comprised in the

request message 3121 to enable the lock 111 to be unlocked based on the access parameters.

Optionally, the permission message 2121 comprises a user selectable web link connecting to the remote intermediate system 41, which web link is adapted to, upon being selected, initiate the request message 3121 to be transmitted to the intermediate system 41.

The permission message 2121 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

Optionally, the access parameters comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

Action 1002

In optional Action 1002, the owner device 21 transmits, e.g. by means of the owner transmitting unit 212, the verification message 2122 to the intermediate system 41, which verification message 2122 comprises the verification parameters corresponding to the access parameters. The unlock message 4121 is adapted to additionally be based on the verification message 2122, to enable the lock 111 to be unlocked additionally based on the verification parameters.

Figure 4 is a flowchart depicting an exemplifying method performed by the user device 31 associated with the temporary user 3, for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, according to embodiments of the disclosure. The exemplifying method, which may be continuously repeated, comprises the following actions discussed with support from Figures 1 and 2.

The vehicle 1 is configured to communicate with the intermediate system 41 adapted to remotely control functionality of the vehicle 1. The intermediate system 41 is configured to transmit the unlock message 4121 to the vehicle 1 to open the remotely operable lock 111 of the locked space 11.

Optionally, the locked space 11 is one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle 1.

Action 1004

In Action 1004, the user device 31 receives, by means of the user receiving unit 311, the permission message 2121 directly or indirectly from the owner device 21 associated with the owner 2 of the vehicle 1, which permission message 2121 comprises the access parameters.

The permission message 2121 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

Optionally, the access parameters comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

Action 1005

In Action 1005, the user device 31 transmits, by means of the user transmitting unit 312, the request message 3121 to open the lock 111, to the intermediate system 41. The request message 4121 comprises the access parameters. The unlock message 4121 is adapted to be based on the request message 3121 to enable the lock 111 to be unlocked based on the access parameters.

Optionally, the permission message 2121 comprises a user selectable web link connecting to the remote intermediate system 41, wherein the Action 1005 of transmitting the request message 3121 comprises the web link being selected.

Optionally, the unlock message 4121 is further adapted to additionally be based on the verification message 2122 configured to be transmitted 1002 from the owner device 21 to the intermediate system 41. The verification message 2122 comprises the verification parameters corresponding to the access parameters, wherein the lock 111 is enabled to be unlocked additionally based on the verifications parameters.

Figure 5 is a flowchart depicting an exemplifying method performed by the intermediate system 41 adapted to remotely control functionality of the vehicle 1, for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1,

according to embodiments of the disclosure. The exemplifying method, which may be continuously repeated, comprises the following actions discussed with support from Figures 1 and 2. The actions may be taken in any suitable order, or even simultaneously, such as Actions 1003 and 1006.

The intermediate system 41 is configured to directly or indirectly communicate with the owner device 21 associated with the owner 2 of the vehicle 1. The owner device 21 is configured to transmit the permission message 2121 comprising the access parameters directly or indirectly to the user device 31 associated with the temporary user 3.

The permission message 2121 may be comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

Optionally, the access parameters comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

Optionally, the locked space 11 is one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of the vehicle 1.

Action 1003

In optional Action 1003, which may be performed following Action 1002 of the owner device 21 transmitting the verification message 2122, the intermediate system 41 receives, e.g. by means of the intermediate receiving unit 411, the verification message 2122 from the owner device 21. The verification message 2122 comprises the verification parameters corresponding to the access parameters. The unlock message 4121 is adapted to additionally be based on the verification message 2122, to enable the lock 111 to be unlocked additionally based on the verification parameters.

Action 1006

In Action 1006, the intermediate system 41 receives, by means of the intermediate receiving unit 411, the request message 3121 to open the remotely operable lock 111 of the locked space 11, from the user device 31, which request message 3121 comprises the access parameters.

Optionally, the permission message 2121 comprises a user selectable web link connecting to the remote intermediate system 4, which web link is adapted to, upon being selected, initiate the request message 3121 to be transmitted to the intermediate system 41.

Action 1007

In Action 1007, the intermediate system 41 transmits, based on the request message 3121, by means of the intermediate transmitting unit 412, the unlock message 4121 to the vehicle 1 to open the lock 111, wherein the lock 111 is enabled to be unlocked based on the access parameters.

Figure 6 is a flowchart depicting an exemplifying method performed by the temporary access system 100, for enabling the temporary user 3 to gain temporary access to the locked space 11 of the vehicle 1, according to embodiments of the disclosure. The actions of Figure 6 reflect the intertwined actions of the owner device 21, user device 31 and intermediate system 41, and thus correspond to Actions 1001 and 1003 of the owner device 21 as described in Figure 3, Actions 1004 and 1005 of the user device 31 as described in Figure 4, and Actions 1003, 1006 and 1007 of the intermediate system 41 as described in Figure 5. The exemplifying method, which may be continuously repeated, hence comprises the following actions, which may be taken in any suitable order, or even simultaneously, such as e.g. Actions 1001' and 1002', and/or Actions 1003' and 1004'.

In **Action 1001'**, the owner device 21 transmits, by means of the owner transmitting unit 212, the permission message 2121 comprising access parameters directly or indirectly to the user device 31.

In optional **Action 1002'**, the owner device 21 transmits the verification message 2122 to the intermediate system 41, which verification message 2122 comprises the verification parameters corresponding to the access parameters.

In optional **Action 1003'**, the intermediate system 41 receives, e.g. by means of the intermediate receiving unit 411, the verification message 2122 from the owner device 21.

In **Action 1004'**, the user device 31 receives, by means of the user receiving unit 311, the permission message 2121 directly or indirectly from the owner device 21.

In **Action 1005'**, the user device 31 transmits, by means of the user transmitting unit 312, the request message 3121 to open the lock 111, to the intermediate system 41. The request message 4121 comprises the access parameters.

Optionally, the permission message 2121 comprises a user selectable web link connecting to the remote intermediate system 41, wherein the Action 1005' of transmitting the request message 3121 comprises the web link being selected.

In **Action 1006'**, the intermediate system 41 receives, by means of the intermediate receiving unit 411, the request message 3121 to open the lock 111, from the user device 31.

In **Action 1007'**, the intermediate system 41 transmits, based on the request message 3121, by means of the intermediate transmitting unit 412, the unlock message 4121 to the vehicle 1 to open the lock 111, wherein the lock 111 is enabled to be unlocked based on the access parameters.

Optionally, the unlock message 4121 is adapted to additionally be based on the verification message 2122, to enable the lock 111 to be unlocked additionally based on the verification parameters.

Figure 7 illustrates an exemplifying signal flow diagram of the temporary access system 100 according to embodiments of the disclosure.

Scenario (a) of Figure 7 reflects the embodiment illustrated in Figure 1a, and with support from Figure 6 thus depicts the owner device 21 transmitting 1001' the permission message 2121 to the user device 31, the user device 31 transmitting 1005' the request message 3121 to the intermediate system 41, and the intermediate system 41 transmitting 1007' the unlock message 4121 to the vehicle 1.

Scenario (b) of Figure 7 reflects the embodiment illustrated in Figure 1b, and with support from Figure 6 thus depicts the owner device 21 transmitting 1001' the permission message 2121 to the user device 31, the owner device 21 transmitting 1002' the optional verification message 2122, the user device 31 transmitting 1005' the request message 3121 to the intermediate system 41, and the intermediate system 41 transmitting 1007' the unlock message 4121 to the vehicle 1.

Scenario (c) of Figure 7 reflects the embodiment illustrated in Figure 1c, and with support from Figure 6 thus depicts the owner device 21 transmitting 1001' the permission message 2121 to the user device 31 via the intermediate system 41, hence the permission message 2121 being represented by the first message 2123 and the second message 4122. Accordingly, there is depicted the owner device 21 transmitting the first message 2123 to the intermediate system 41, and the intermediate system 41 transmitting the second message 4122 to the user device 31. There is furthermore depicted the user device 31 transmitting 1005' the request message 3121 to the intermediate system 41, and the intermediate system 41 transmitting 1007' the unlock message 4121 to the vehicle 1.

Consequently, according to the enabling of a temporary user 3 to gain temporary access to a locked space 11 of a vehicle 1 as described in the foregoing, access conditions incorporated by access parameters, which descend from a permission message 2121 dictated and transmitted from an owner device 21 to a user device 31 and subsequently to an intermediate system 41 in a request message 3121, may be utilized by the intermediate system 41 as underlying conditions for a subsequent provision of temporary access to the locked space 11.

The person skilled in the art realizes that the present disclosure by no means is limited to the preferred embodiments described above. On the contrary, many modifications and variations are possible within the scope of the appended claims. It should furthermore be noted that the drawings not necessarily are to scale and the dimensions of certain features may have been exaggerated for the sake of clarity. Emphasis is instead placed upon illustrating the principle of the embodiments herein. Additionally, in the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality.

CLAIMS

1. A method performed by a **temporary access system** (100) for enabling a temporary user (3) to gain temporary access to a locked space (11) of a vehicle (1), said temporary access system (100) comprising an **owner device** (21) associated with an owner (2) of said vehicle (1), a **user device** (31) associated with said temporary user (3), and an **intermediate system** (41) adapted to remotely control functionality of said vehicle (1), said intermediate system (41) being configured to directly or indirectly communicate with said owner device (21), said owner device (21) being configured to control functionality of said vehicle (1) by communication with said intermediate system (41), said method comprising:

transmitting (1001, 1001'), by means of said owner device (21), a permission message (2121) comprising access parameters directly or indirectly to said user device (31);

receiving (1004, 1004'), by means of said user device (31), said permission message (2121) directly or indirectly from said owner device (21);

transmitting (1005, 1005'), by means of said user device (31), a request message (3121) to open a remotely operable lock (111) of said locked space (11), to said intermediate system (41), wherein said request message (3121) comprises said access parameters;

receiving (1006, 1006'), by means of said intermediate system (41), said request message (3121) from said user device (31); and

transmitting (1007, 1007'), by means of said intermediate system (41), based on said request message (3121) an unlock message (4121) to said vehicle (1) to open said lock (111), wherein said lock (111) is enabled to be unlocked based on said access parameters.

2. The method according to claim 1, wherein said permission message (2121) comprises a user selectable web link connecting to said remote intermediate system (41), said *transmitting* (1005) the request message (3121) comprising said web link being selected.

3. The method according to claim 1 or 2, further comprising:

transmitting (1002, 1002'), by means of said owner device (21), a verification message (2122) to said intermediate system (41), said verification

message (2122) comprising verification parameters corresponding to said access parameters;

receiving (1003, 1003'), by means of said intermediate system (41), said verification message (2122) from said owner device (21), wherein said unlock message (4121) is adapted to additionally be based on said verification message (2122), to enable said lock (111) to be unlocked additionally based on said verification parameters.

4. The method according to any one of the preceding claims, wherein said permission message (2121) is comprised in at least one Short Message Service, SMS, message, at least one email and/or a corresponding type of message.

5. The method according to any one of the preceding claims, wherein said access parameters comprise one or several of vehicle identification parameters, time frame parameters, location parameters, and/or recurrence parameters.

6. The method according to any one of the preceding claims, wherein said locked space (11) is one or a combination of a body, a trunk, an engine hood, a fuel lid and/or an isolated section of said vehicle (1).

7. A **temporary access system** (100) adapted for enabling a temporary user (3) to gain temporary access to a locked space (11) of a vehicle (1), said temporary access system (100) comprising an **owner device** (21) associated with an owner (2) of said vehicle (1), a **user device** (31) associated with said temporary user (3), and an **intermediate system** (41) adapted to remotely control functionality of said vehicle (1), said intermediate system (41) being configured to directly or indirectly communicate with said owner device (21), said owner device (21) being configured to control functionality of said vehicle (1) by communication with said intermediate system (41),

said owner device (21) comprising: an **owner transmitting unit** (212) adapted for *transmitting* (1001) a permission message (2121) comprising access parameters directly or indirectly to said user device (31);

said user device (31) comprising: a **user receiving unit** (311) adapted for *receiving* (1004) said permission message (2121) directly or indirectly from said owner device (21); and a **user transmitting unit** (312) adapted for *transmitting*

(1005) a request message (3121) to open a remotely operable lock (111) of said locked space (11), to said remote intermediate system (41), wherein said request message (3121) comprises said access parameters; and

said intermediate system (41) comprising: an **intermediate receiving unit** (411) adapted for *receiving* (1006) said request message (3121) from said user device (31); and an **intermediate transmitting unit** (412) adapted for *transmitting* (1007), based on said request message (3121), an unlock message (4121) to said vehicle (1) to open said lock (111), wherein said lock (111) is enabled to be unlocked based on said access parameters.

8. A **vehicle** (1) comprising a remotely operable lock (111) of a locked space (11) of said vehicle (1), which vehicle (1) is adapted for enabling a temporary user (3) to gain temporary access to said locked space (11), said vehicle (1) being configured to communicate with an intermediate system (41) adapted to remotely control functionality of said vehicle (1), said intermediate system (41) being configured to directly or indirectly communicate with an owner device (21) associated with an owner (2) of said vehicle (1), said owner device (21) being configured to control functionality of said vehicle (1) by communication with said intermediate system (41), said owner device (21) being adapted for *transmitting* (1001) a permission message (2121) comprising access parameters directly or indirectly to a user device (31) associated with said temporary user (3), said user device (31) being adapted for *transmitting* (1005) a request message (3121) to open said lock (111), to said remote intermediate system (41), said request message (3121) being configured to comprise said access parameters,

said vehicle (1) being adapted to receive, from said intermediate system (41), based on said request message (3121), an unlock message (4121) to open said lock (111), wherein said lock (111) is enabled to be unlocked based on said access parameters.

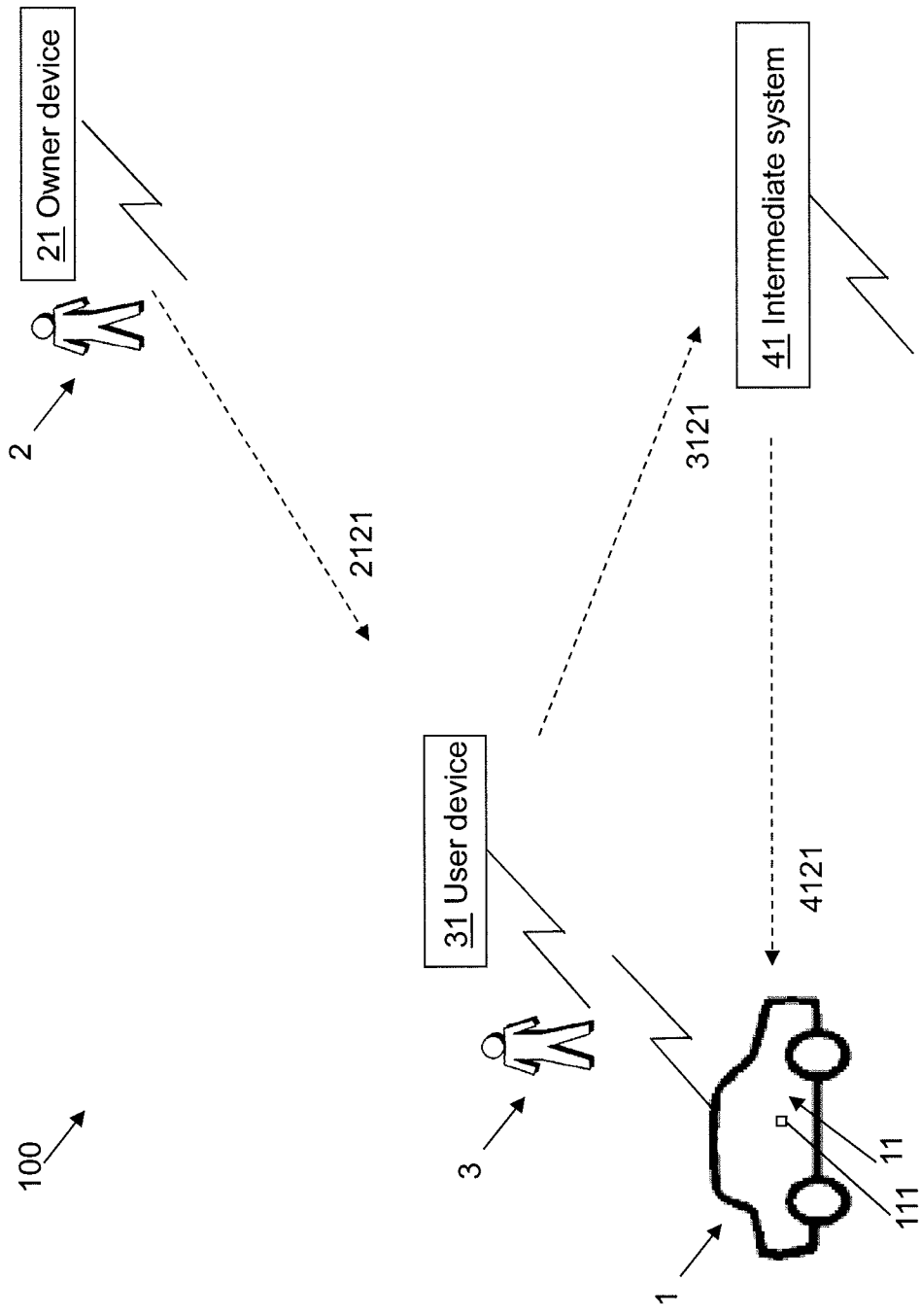

21 Owner device
2
2121
41 Intermediate system
3121
31 User device
4121
3
100
1
11
111

Fig. 1a

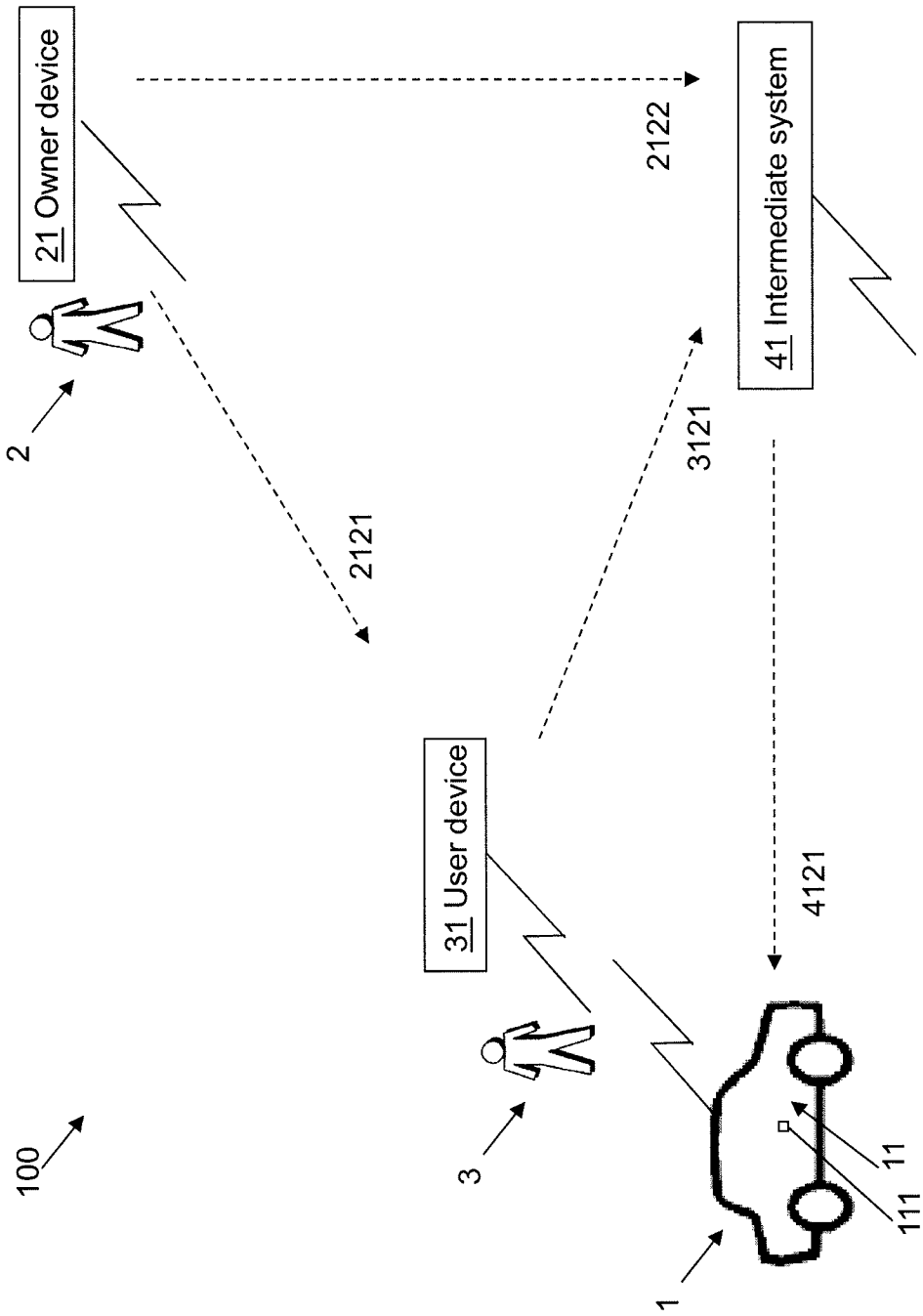

21 Owner device
2
2121
2122
41 Intermediate system
3121
31 User device
4121
3
100
1
11
111

Fig. 1b

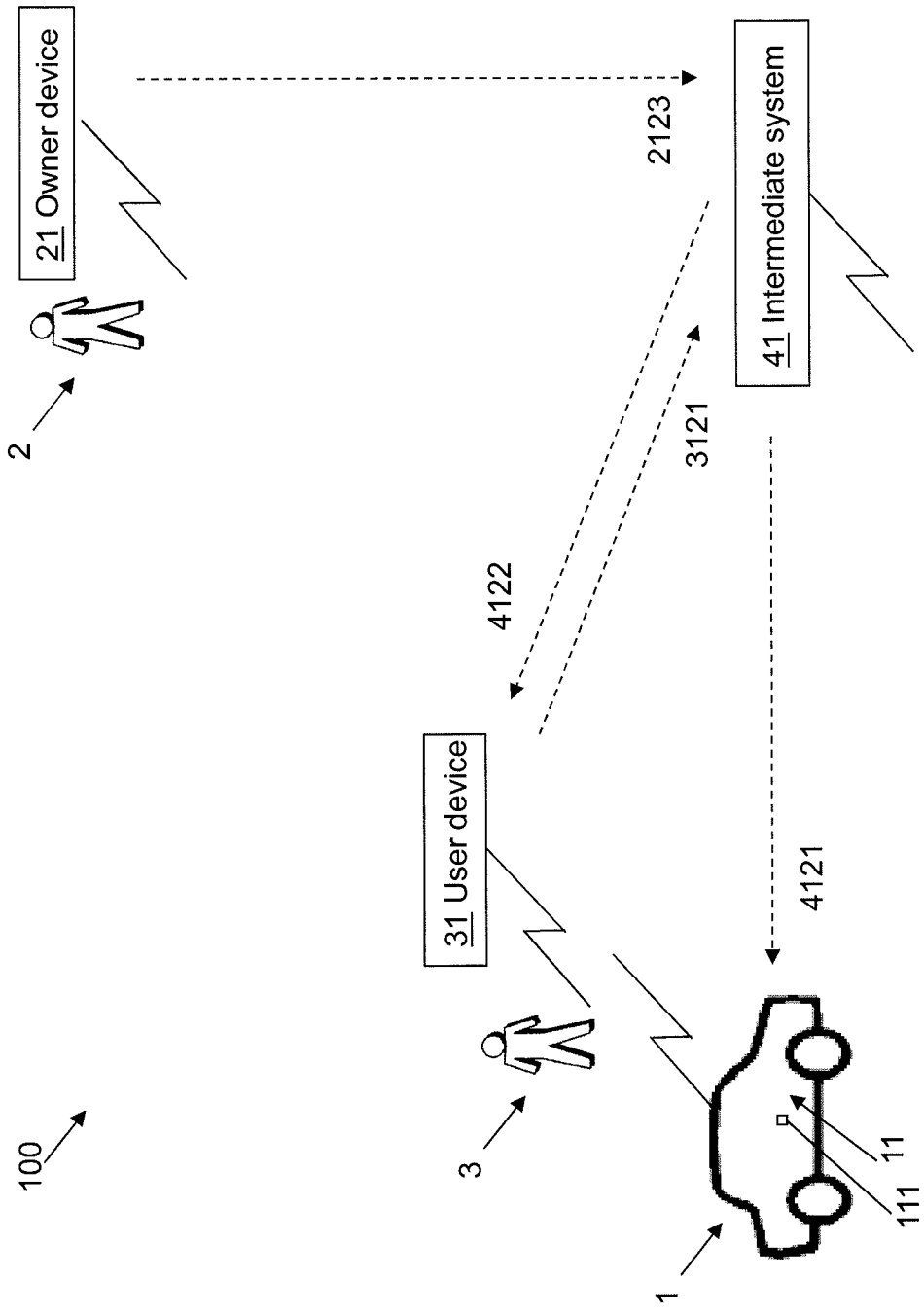

21 Owner device
2
2123
41 Intermediate system
3121
4122
31 User device
4121
100
3
1
11
111

Fig. 1c

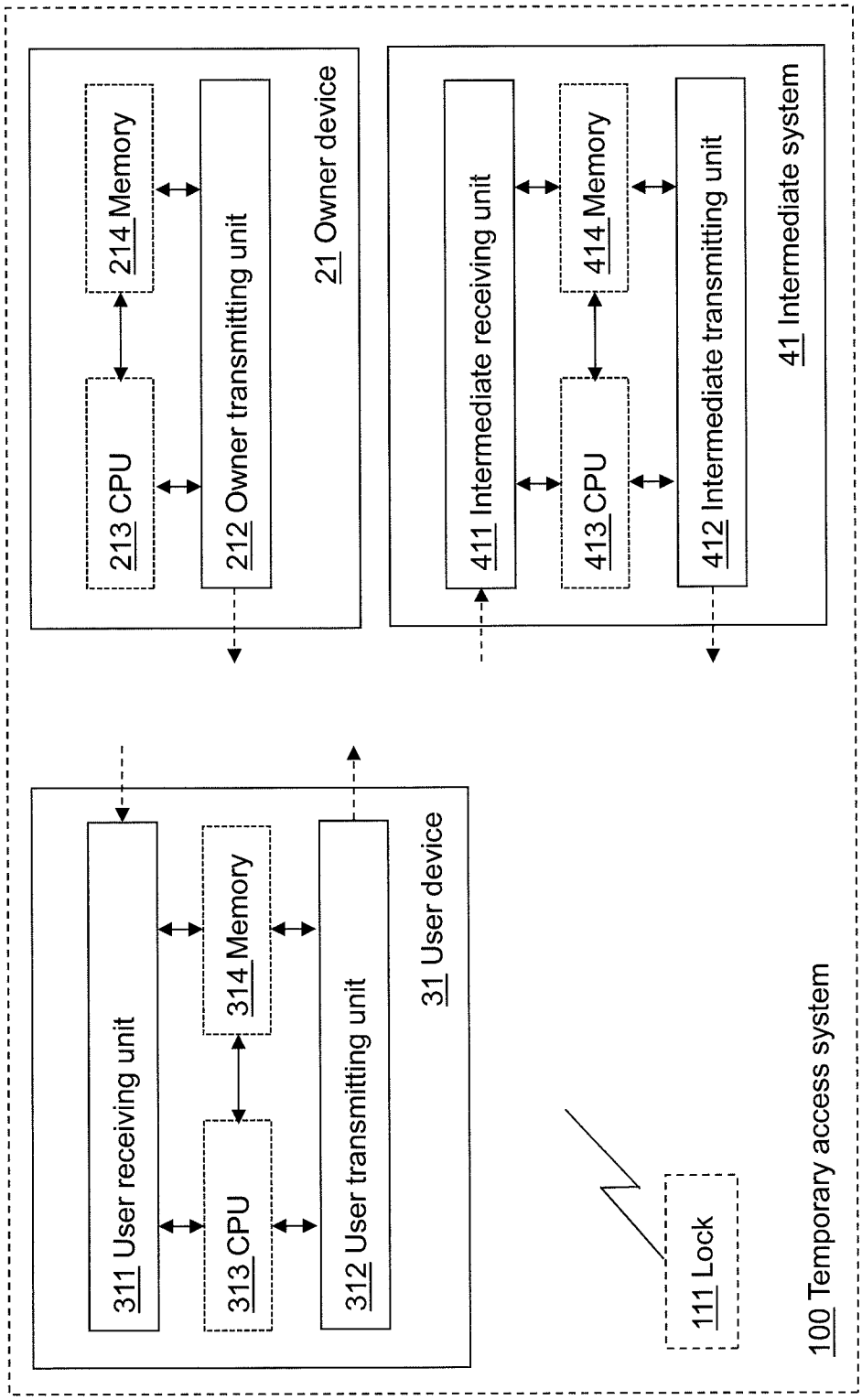

100 Temporary access system
111 Lock
31 User device
311 User receiving unit
313 CPU
314 Memory
312 User transmitting unit
41 Intermediate system
411 Intermediate receiving unit
413 CPU
414 Memory
412 Intermediate transmitting unit
21 Owner device
213 CPU
214 Memory
212 Owner transmitting unit

Fig. 2

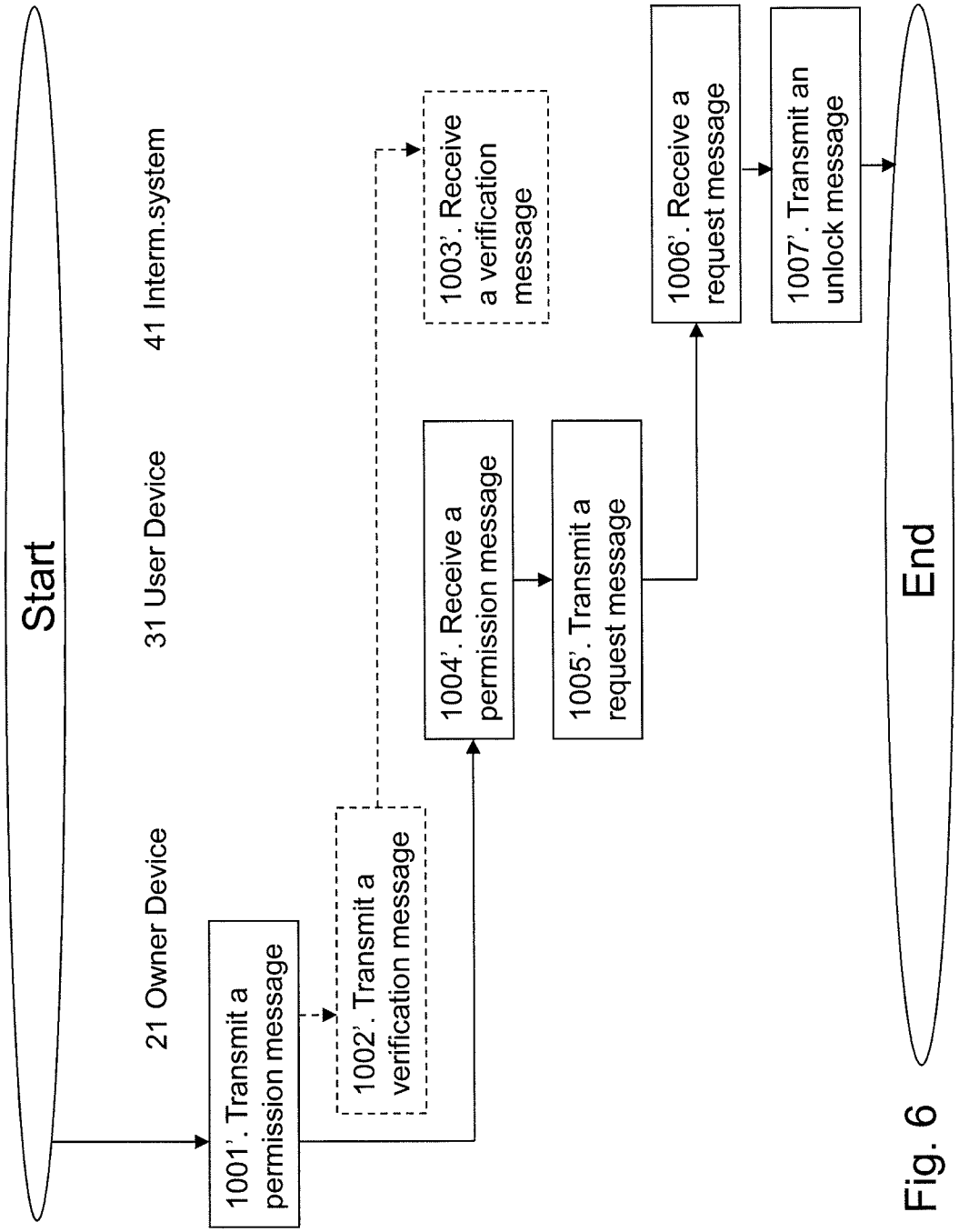

Start
21 Owner Device
31 User Device
41 Interm.system
1001'. Transmit a permission message
1002'. Transmit a verification message
1003'. Receive a verification message
1004'. Receive a permission message
1005'. Transmit a request message
1006'. Receive a request message
1007'. Transmit an unlock message
End

Fig. 6

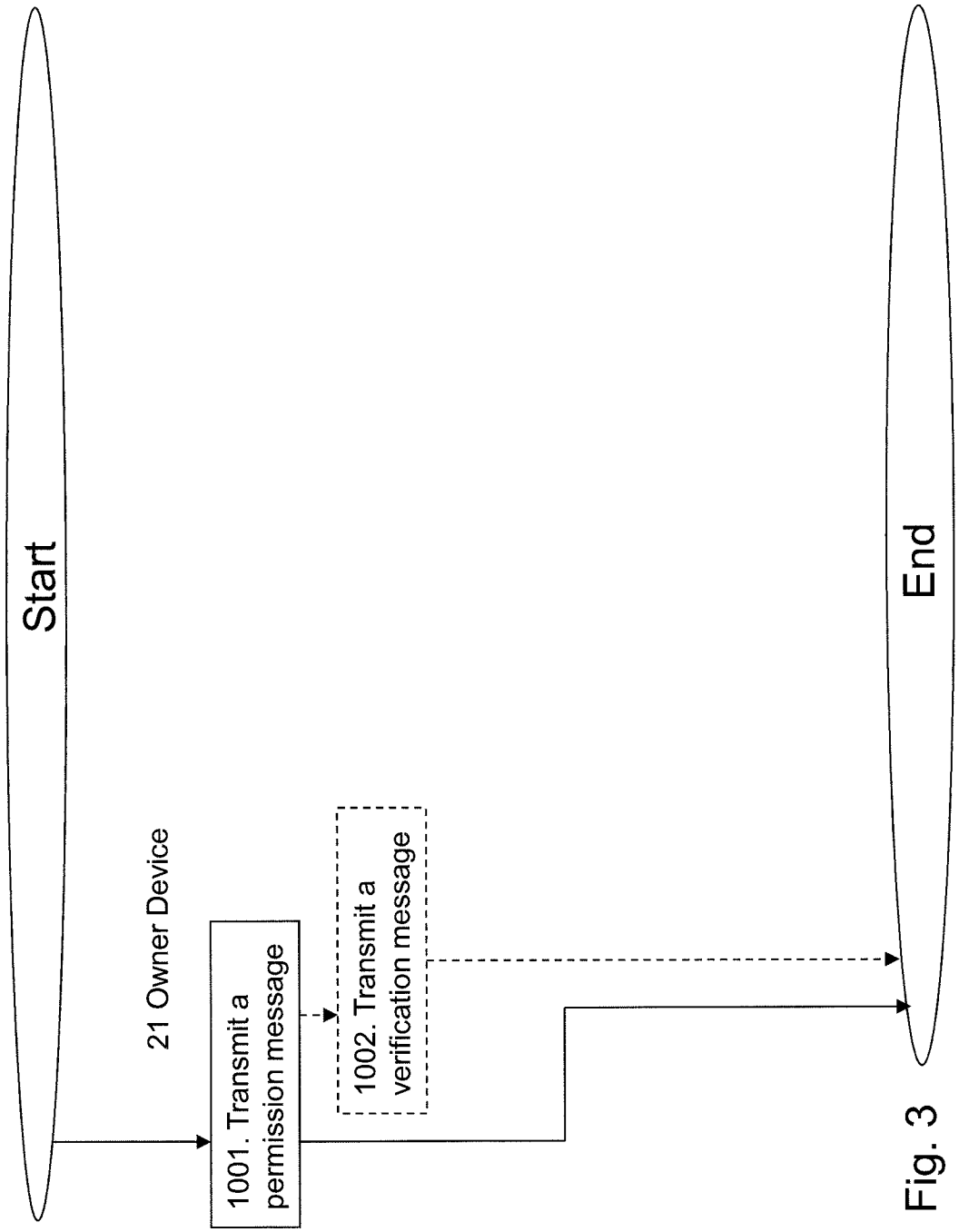

Start
21 Owner Device
1001. Transmit a permission message
1002. Transmit a verification message
End

Fig. 3

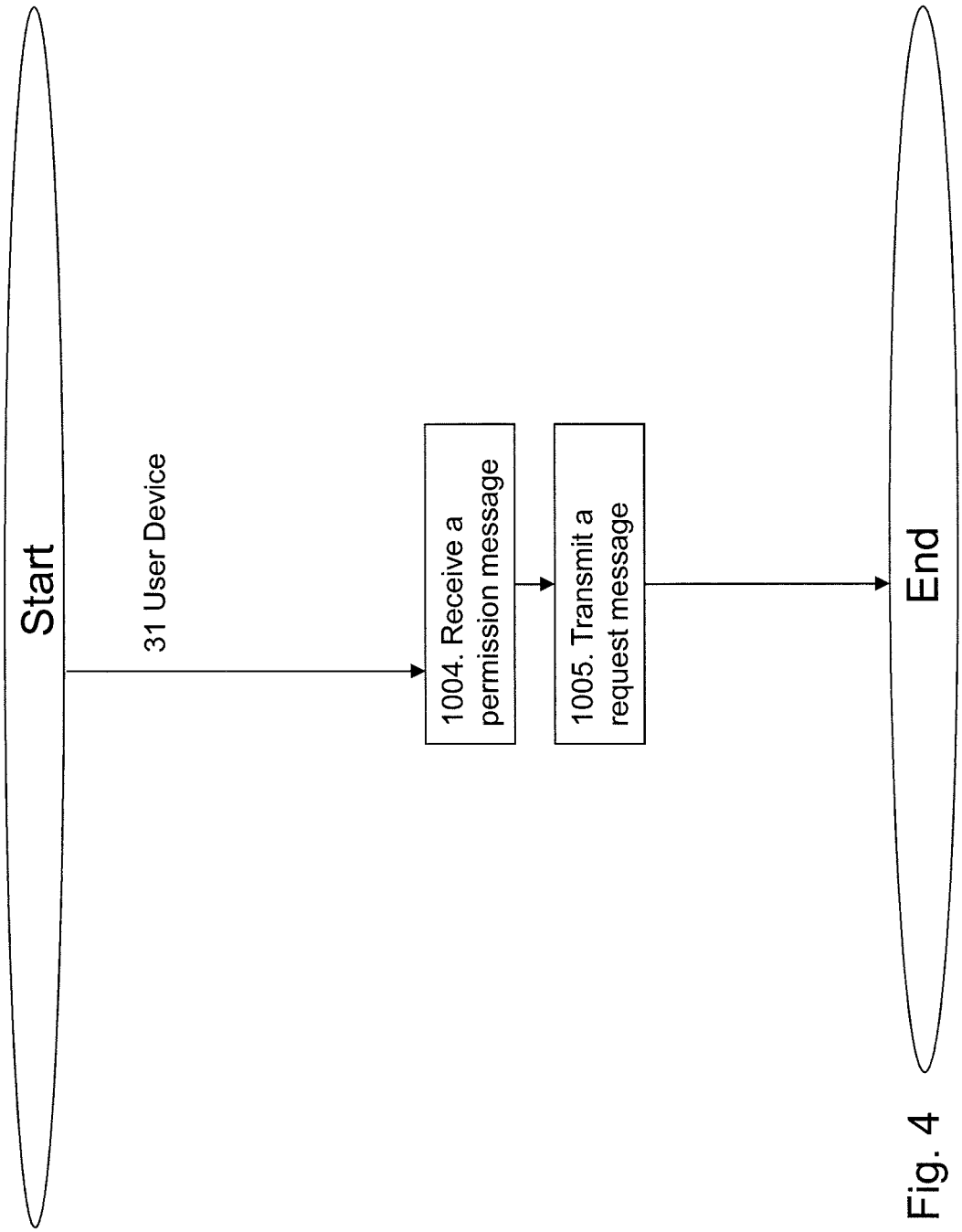

Start
31 User Device
1004. Receive a permission message
1005. Transmit a request message
End

Fig. 4

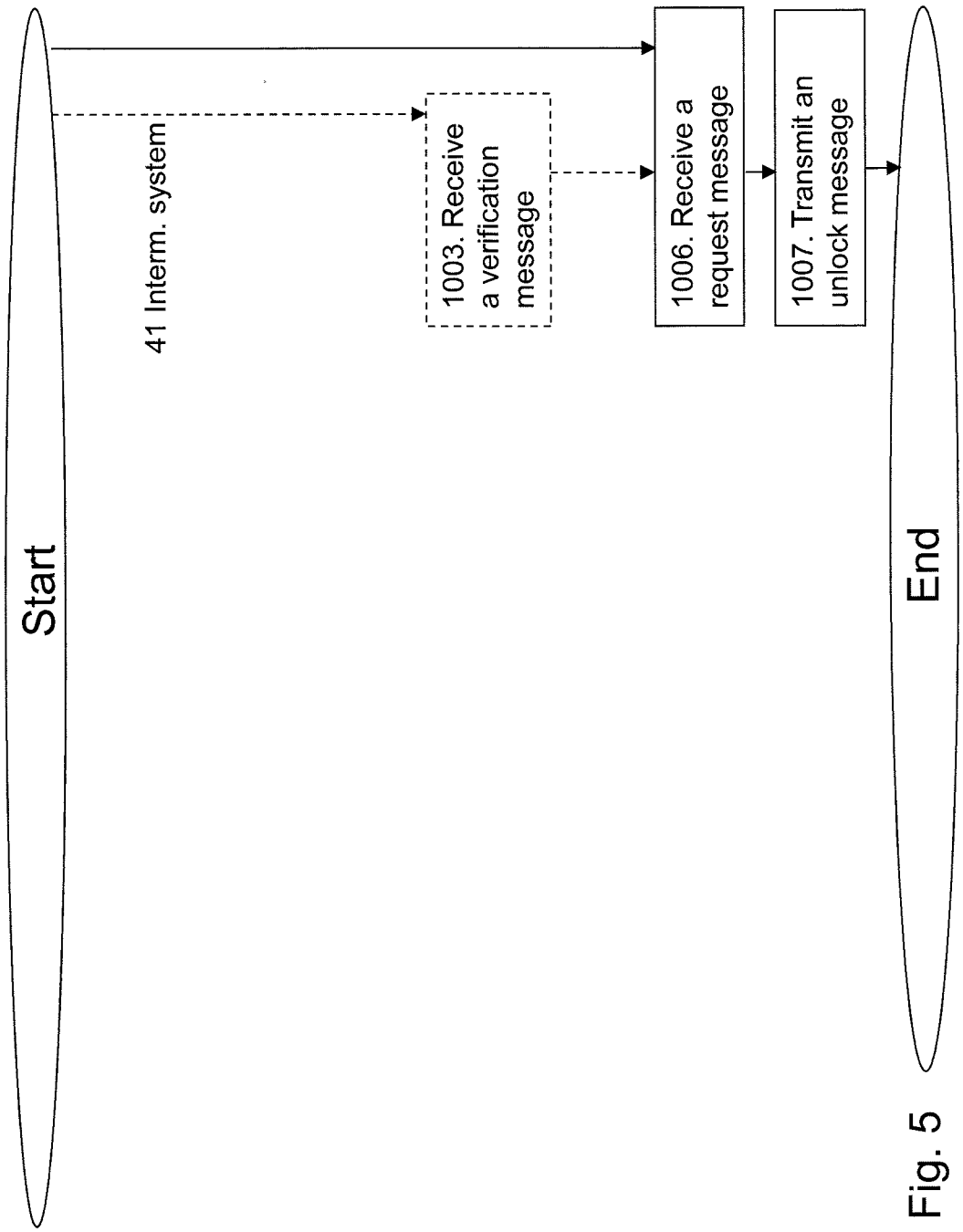

Start
41 Interm. system
1003. Receive a verification message
1006. Receive a request message
1007. Transmit an unlock message
End

Fig. 5

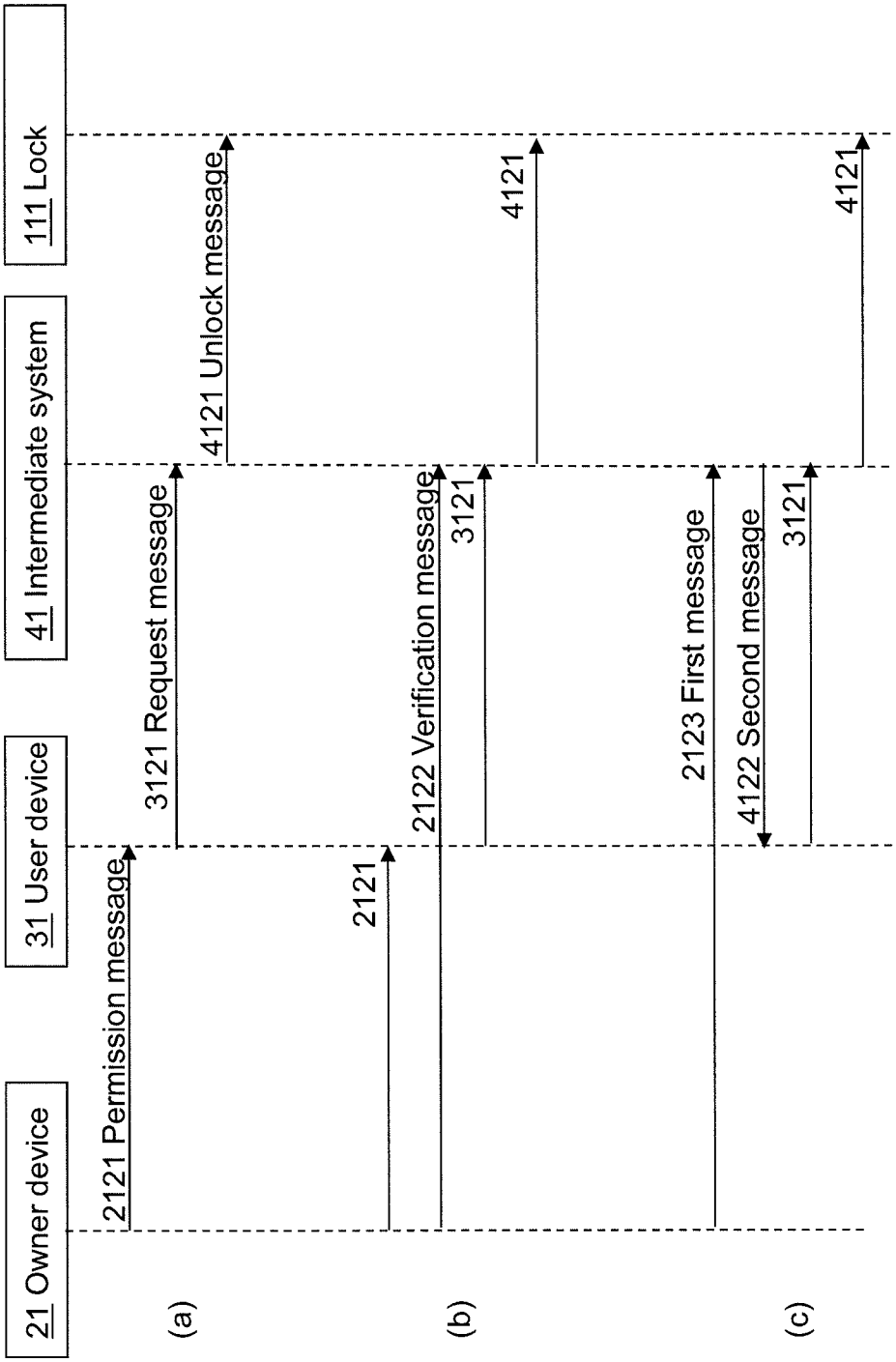

21 Owner device
31 User device
41 Intermediate system
111 Lock
2121 Permission message
3121 Request message
4121 Unlock message
2121
2122 Verification message
3121
4121
(a)
(b)
2123 First message
4122 Second message
3121
4121
(c)

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/060588

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07C9/00
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)
G07C B60R

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

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X	US 2014/002236 A1 (PINEAU STEPHEN [CA] ET AL) 2 January 2014 (2014-01-02) paragraph [0055] paragraph [0066] paragraph [0186] paragraph [0188] - paragraph [0194] paragraph [0013] - paragraph [0015] -----	1-8
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A	paragraph [0002] paragraph [0012] - paragraph [0015] paragraph [0019] - paragraph [0020] paragraph [0022] - paragraph [0023] paragraph [0027] - paragraph [0036] figures 1,2,3 -----	3
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 July 2015	28/07/2015

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	Ngandu, William

3

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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International application No
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