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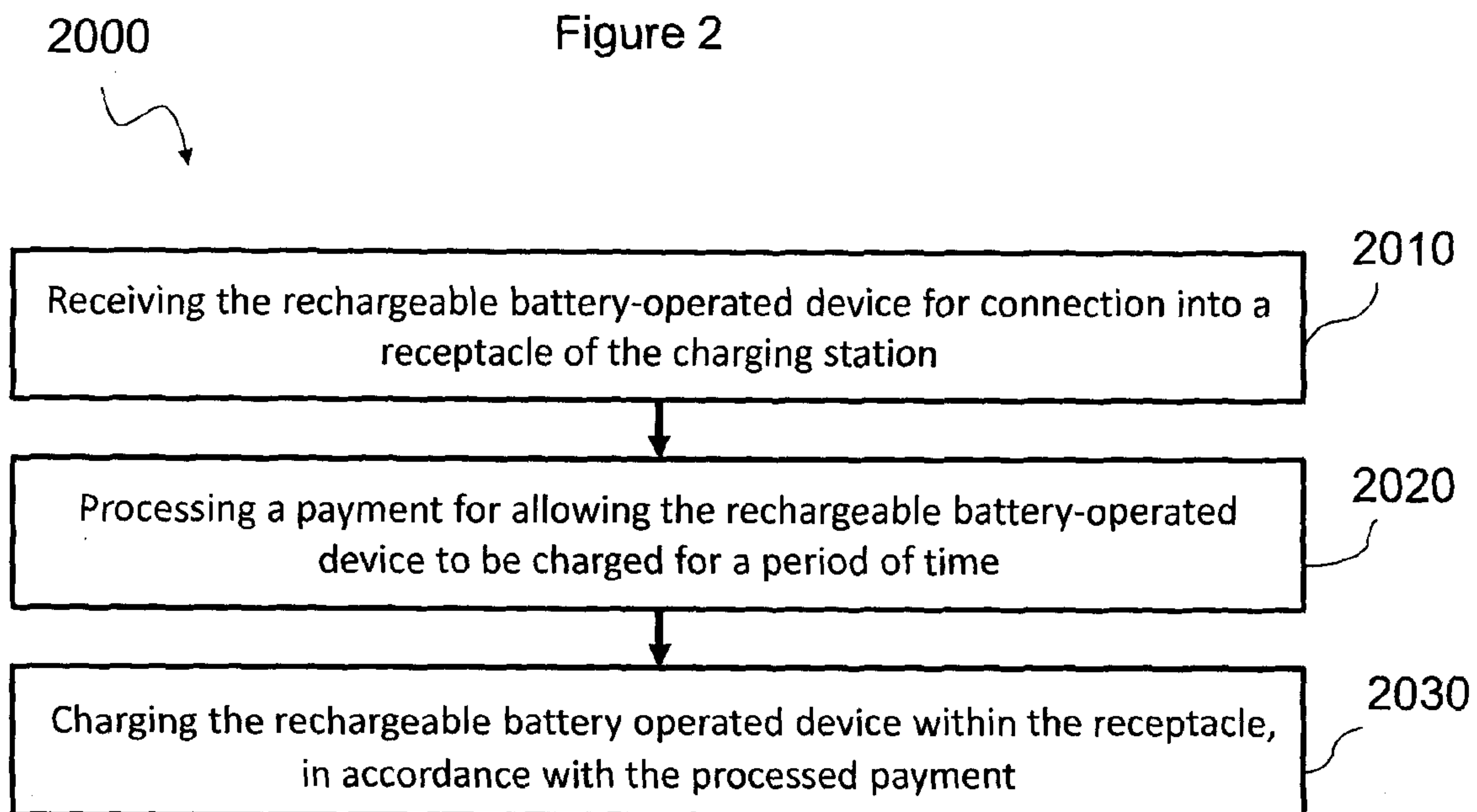
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(54) **Titre : POSTE DE CHARGE AUTONOME**  
 (54) **Title: AUTONOMOUS CHARGING STATION**



(57) **Abrégé/Abstract:**

Method and charging station for charging rechargeable battery-operated device(s). The charging station comprises at least one receptacle for receiving at least one rechargeable battery-operated device to be charged, a payment module for processing a payment for allowing one or more of the at least one rechargeable battery-operated device to be charged for a period of time and a charging module for charging the one or more of the at least one rechargeable battery-operated device within the at least one receptacle, in accordance with the processed payment, the charging module receiving electrical power from a local power generator. The method comprises receiving the rechargeable battery-operated device for connection into the receptacle, processing a payment for allowing the rechargeable battery-operated device to be charged for a period of time and charging the rechargeable battery-operated device within the receptacle, in accordance with the processed payment.

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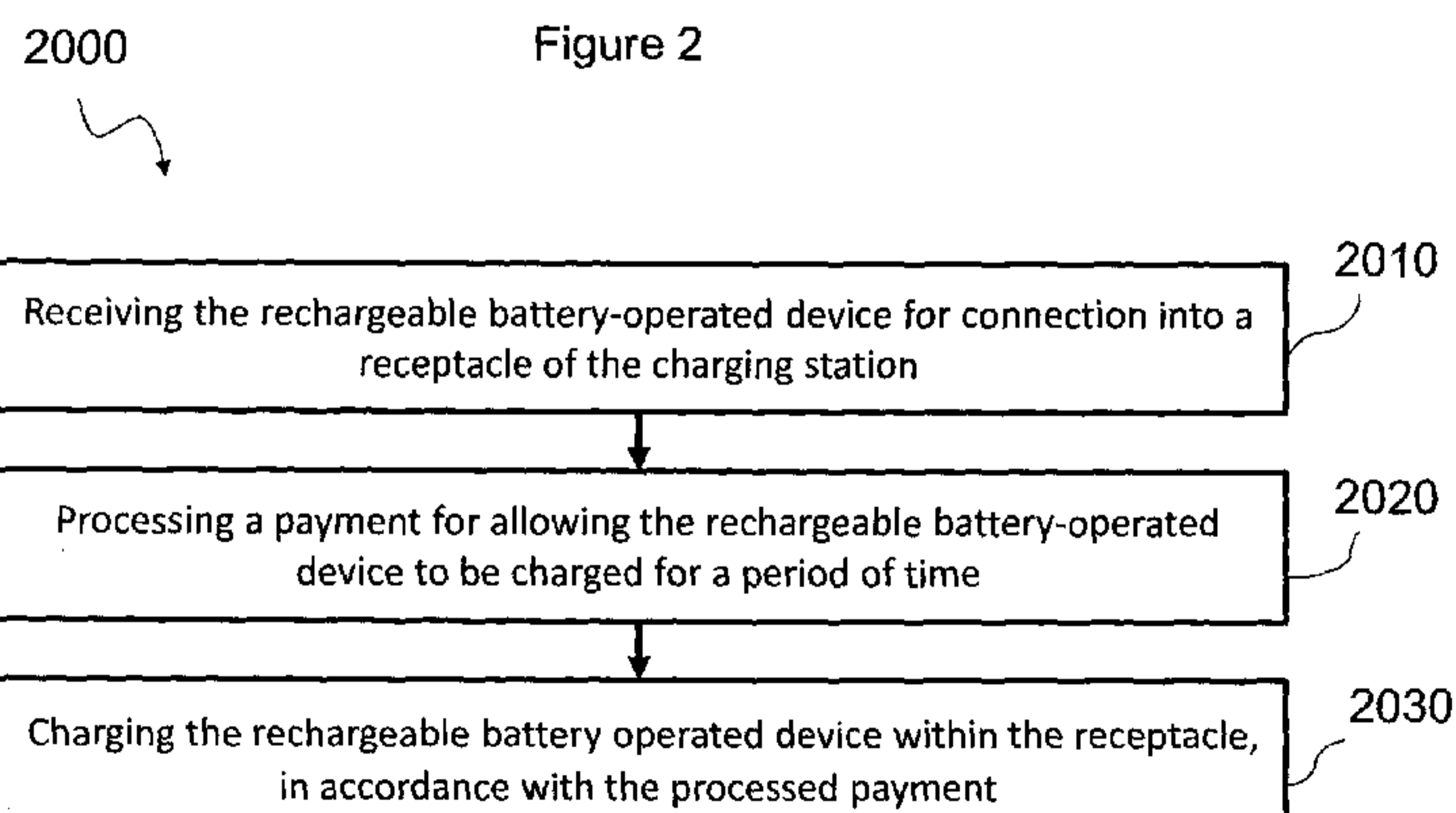
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(54) Title: AUTONOMOUS CHARGING STATION



(57) Abstract: Method and charging station for charging rechargeable battery-operated device(s). The charging station comprises at least one receptacle for receiving at least one rechargeable battery-operated device to be charged, a payment module for processing a payment for allowing one or more of the at least one rechargeable battery-operated device to be charged for a period of time and a charging module for charging the one or more of the at least one rechargeable battery-operated device within the at least one receptacle, in accordance with the processed payment, the charging module receiving electrical power from a local power generator. The method comprises receiving the rechargeable battery-operated device for connection into the receptacle, processing a payment for allowing the rechargeable battery-operated device to be charged for a period of time and charging the rechargeable battery-operated device within the receptacle, in accordance with the processed payment.

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## AUTONOMOUS CHARGING STATION

### Priority Statement

[0001] This non-provisional patent application claims priority based upon the prior U.S. provisional patent applications entitled "AUTONOMOUS CHARGING STATION", application number 61/980,841, filed April 17, 2014, in the names of Francis TOURIGNY  
5 Edouard AUBÉ and Leo CLARKIN, which is hereby incorporated by reference in its entirety.

### Technical field

[0002] The present invention relates to a charging station and, more particularly, to an autonomous charging station.

### 10 Background

[0003] Certain areas of the world are poorly connected to the electrical grid. Getting electrical power for different day-to-day needs becomes difficult and dangerous. In some other regions, people seek to rely on alternate source of electrical power.

[0004] The present invention generally addresses the need for electric power.

### 15 Summary

[0005] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

20 [0006] A first aspect of the present invention is directed to a charging station comprising at least one receptacle for receiving at least one rechargeable battery-operated device to be charged, a payment module for processing a payment for allowing one or more of the at least one rechargeable battery-operated device to be charged for a period of time and a charging module for charging the one or more of the at least one rechargeable battery-operated device  
25 within the at least one receptacle, in accordance with the processed payment, the charging module receiving electrical power from a local power generator.

[0007] Optionally, the at least one rechargeable battery-operated device may comprise a power pack device and a portable electronic device.

[0008] The charging station may also comprise an account management module for managing at least one account. The payment may be used to replenish a balance of charging credits associated with the at least one account, each of the charging credits allowing the one or more of the at least one rechargeable battery-operated device to be charged for the period of time.

[0009] The charging station may further comprise an input/output module for allocating one or more of the charging credits to one or more of the at least one receptacle. The account management module may then further be for removing the allocated charging credits from the balance and activating the charging module for the one or more of the at least one receptacle.

[0010] The input/output module may also be for allowing authentication into the at least one account and the account management module may be further for, following the authentication, removing at least one allocated charging credit from the balance when a connection is established with the one or more of the at least one rechargeable battery-operated device within the at least one receptacle. The payment module may also be further for processing at least one rental payment for maintaining the at least one account on the charging station, wherein the at least one account being maintained is a requirement of the authentication.

[0011] The account management module may also further be for managing a plurality of secondary accounts associated with the at least one account, the charging station further comprising an input/output module for allocating one or more of the charging credits to one or more of the secondary accounts.

[0012] The period of time may end when one or more of the following conditions are met:

[0013] - a timer expires;

[0014] - a quantity of energy has been provided;

[0015] - the battery-operated device is fully charged;

[0016] - the battery-operated device is disconnected;

- [0017] - the battery-operated device is disconnected and a different battery-operated device is connected
- [0018] - a door of the at least one receptacle is opened;
- [0019] - the door of the at least one receptacle is unlocked; and
- 5 [0020] - more than one battery-operated device is connected within a single of the at least one receptacle.
- [0021] The charging station may further comprise a network interface module and the payment module may receive a confirmation of the processed payment through the network interface module.
- 10 [0022] The charging station may also comprise a station management module for remotely monitoring the charging station through the network interface module. The station management module allowing at least one of:
- [0023] - camera monitoring of the charging station and/or surroundings thereof;
- [0024] - accelerometer monitoring of the charging station; and
- 15 [0025] - integrity monitoring of the charging station;
- [0026] - The station management module may be capable of sending network alerts, based on monitoring conditions, towards at least one of a law enforcement agency, a mobile operator, a charging station's owner, a registered charging station's user and/or a registered charging station's manager.
- 20 [0027] The confirmation of the payment may be received, through a cellular network, from:
- [0028] - a credit card issuer;
- [0029] - an online payment service provider;
- [0030] - a prepaid card issuer;
- 25 [0031] - a mobile network operator; or
- [0032] - a interbank transfer service.

**[0033]** The local power generator may comprise a solar generator integrated with a housing of the charging station and/or the local power generator may comprise a wind generator collocated with a housing of the charging station. The local power generator may be autonomous by being disconnected from the distribution grid.

5 **[0034]** The input/output module may comprise a Graphical User Interface (GUI) operated through a touch sensitive surface. The GUI may be for presenting instructional information via graphical instructions with minimal textual instructions.

**[0035]** The charging station may further comprise a plurality of charging ports adapted for connecting the rechargeable battery operated device, within the at least one receptacle, to the  
10 charging module. The plurality of charging ports may comprise at least two of:

**[0036]** - one or more Universal Serial Bus (USB) interfaces;

**[0037]** - a 120/240 VAC on 50/60 Hz interface;

**[0038]** - a proprietary power-pack charging interface; and

**[0039]** - one or more Power of Ethernet (POE) interfaces.

15 **[0040]** The charging station may also further comprise at least one door to lock the at least one receptacle.

**[0041]** The charging module may further be for measuring a battery charge of the battery-operated device and /or for calculating a charge time of the battery-operated device.

**[0042]** The charging module may also further be for visually indicating when the battery  
20 has been charged.

**[0043]** The network interface module may further be for providing a public Wireless Local Area Network (WLAN) access towards a cellular network, wherein the payment module is further for processing one or more access payments for accessing the WLAN and/or Mobile Network Operator (MNO) network range extension functionality.

25 **[0044]** A second aspect of the present invention is directed to a method for charging a rechargeable battery-operated device comprising receiving the rechargeable battery-operated device for connection into a receptacle of a charging station, the charging station receiving electrical power from a local power generator, processing a payment for allowing the

rechargeable battery-operated device to be charged for a period of time and charging the rechargeable battery-operated device within the receptacle, in accordance with the processed payment.

5 [0045] Optionally, the rechargeable battery-operated device may be a power pack device or a portable electronic device.

[0046] Processing the payment may further comprise replenishing a balance of charging credits associated with an account, each of the charging credits allowing the rechargeable battery-operated device to be charged for the period of time.

10 [0047] The method may further comprise, prior to charging, allocating one or more of the charging credits to the receptacle and removing the allocated charging credits from the balance, wherein charging is performed by activating a charging module for the receptacle.

15 [0048] The method may also further comprise authenticating into the account and, following the authentication, removing at least one allocated charging credit from the balance when a connection is established with the rechargeable battery-operated device within the receptacle.

[0049] The method may yet also further comprise processing at least one rental payment for maintaining the account on the charging station, wherein the account being maintained is a requirement of the authentication.

20 [0050] The method may also comprise managing a plurality of secondary accounts associated with the account and allocating one or more of the charging credits to one or more of the secondary accounts.

[0051] The period of time may end when one or more of the following conditions are met:

[0052] - a timer expires;

[0053] - a quantity of energy has been provided;

25 [0054] - the battery-operated device is fully charged;

[0055] - the battery-operated device is disconnected;

[0056] - the battery-operated device is disconnected and a different battery-operated device is connected

[0057] - a door of the at least one receptacle is opened;

[0058] - the door of the at least one receptacle is unlocked; and

[0059] - more than one battery-operated device is connected within a single of the at least one receptacle.

5 [0060] The method may also further comprise receiving a confirmation of the processed payment through a network interface module of the charging station, and, optionally, remotely monitoring the charging station through the network interface module by allowing at least one of:

[0061] - camera monitoring of the charging station and/or surroundings thereof;

10 [0062] - accelerometer monitoring of the charging station; and

[0063] - integrity monitoring of the charging station;

[0064] The method may then further comprises sending network alerts, based on monitoring conditions, towards at least one of a law enforcement agency, a mobile operator, a charging station's owner, a registered charging station's user and/or a registered charging station's manager.

15

[0065] The confirmation may be received, through a cellular network, from:

[0066] - a credit card issuer;

[0067] - an online payment service provider;

[0068] - a prepaid card issuer;

20 [0069] - a mobile network operator; or

[0070] - a interbank transfer service.

[0071] The local power generator may comprise a solar generator integrated with a housing of the charging station and/or a wind generator collocated with a housing of the charging station. The local power generator may be autonomous by being disconnected from the distribution grid.

25

[0072] A Graphical User Interface (GUI) operated through a touch sensitive surface may also be provided. The GUI may be for presenting instructional information via graphical instructions with minimal textual instructions.

[0073] The method may comprise providing a plurality of charging ports adapted for connecting the rechargeable battery operated device, within the receptacle. The plurality of charging ports may comprise at least two of:

[0074] - one or more Universal Serial Bus (USB) interfaces;

[0075] - a 120/240 VAC on 50/60 Hz interface; and

[0076] - a proprietary power-pack charging interface; and

10 [0077] - one or more Power of Ethernet (POE) interfaces.

[0078] The method may also further comprise providing at least one door to lock the receptacle, measuring a battery charge of the battery-operated device, calculating a charge time of the battery-operated device and/or visually indicating when the battery has been charged.

15 [0079] The method may further comprise providing a public Wireless Local Area Network (WLAN) access towards a cellular network and processing one or more access payments for accessing the WLAN and/or providing Mobile Network Operator (MNO) network range extension functionality.

#### **Brief description of the drawings**

20 [0080] Further features and exemplary advantages of the present invention will become apparent from the following detailed description, taken in conjunction with the appended drawings, in which:

[0081] Figure 1 shows a logical modular representation of a system comprising an exemplary charging station in accordance with the teachings of the present invention; and

25 [0082] Figure 2 shows a flow chart of an exemplary method for charging a rechargeable battery-operated device in accordance with the teachings of the present invention.

**Detailed description**

[0083] It has been noticed that, in recent years and in many areas, the connection to the grid or to line-wired phones improved less rapidly than connectivity to a cellular network (voice and/or data). No indication suggests that the trend is temporary.

5 [0084] In the same areas, it has also been noticed that people take different risks to get electrical power. For instance, diesel or kerosene generators and/or lanterns are sometimes used inside the homes (e.g., for charging devices or for lighting purposes). It has also been noticed that many people would give their mobile phone to a messenger (or modern-age mailman) that would walk or drive over a certain distance to reach a grid-connected location  
10 where the phone is charged for a fee. People may then remain without a mobile phone for a long while and take the risk of having their phone lost or stolen.

[0085] If ever the distribution grid is available, connectivity and/or distribution may be difficult. In addition, energy from the grid may be produced from non-environmental friendly sources.

15 [0086] A secured autonomous charging station for portable devices and/or portable power sources would therefore be useful to overcome at least some of these drawbacks.

[0087] Reference is now made to the drawings in which Figure 1 shows a modular logical representation of an exemplary charging station 1000 in accordance with the teachings of the present invention. The charging station 1000 comprises at least one receptacle (1010 to 1016),  
20 a payment module 1020 and a charging module 1030. The charging module receives electrical power from a local power generator 1400. For instance, the local power generator 1400 may comprise a solar generator integrated with a housing of the charging station and/or a wind generator collocated with the housing of the charging station. In the most commonly envisioned embodiments, the local power generator is autonomous by being disconnected  
25 from the distribution grid. In other embodiments, the charging station may be connected to the grid and use power therefrom only when strictly necessary (e.g., failure of the local power generator or failure of an accumulating device of the local power generator, failure to meet the energy demand, etc.).

[0088] Skilled persons will readily understand that the number of actual receptacles 1010-  
30 1016 may vary without affecting the present invention. Each receptacle 1010-1016 is for receiving at least one rechargeable battery-operated device to be charged. The rechargeable

battery-operated device may be at least a power pack device 1200 or a portable electronic device 1100 (e.g. a mobile phone, a handheld music player, a portable GPS system, smart tablets, car batteries, etc.).

5 [0089] The payment module 1020 is for processing a payment for allowing one or more rechargeable battery-operated devices 1100, 1200 to be charged for a period of time. The charging module 1030 is for charging the rechargeable battery-operated device(s) 1100, 1200 within the relevant receptacle(s) 1010-1016, in accordance with the processed payment.

10 [0090] An account management module 1040 may be provided for managing at least one account. The payment maybe used to replenish a balance of charging credits associated with an account. Each of the charging credits may allow the rechargeable battery-operated device to be charged for the period of time. An input/output module 1050 may also be provided for allocating one or more of the charging credits to one or more receptacles 1010-1016. The account management module 1040 may then remove the allocated charging credits from the balance and activate the charging module 1030 for the relevant receptacles 1010-1016.

15 [0091] The optional input/output module 1050 may also be used for allowing authentication into the account. The account management module may then, following the authentication, remove at least one allocated charging credit from the balance when a connection is established with the rechargeable battery-operated device within the receptacle 1010-1016.

20 [0092] The input/output module 1050 may comprise a Graphical User Interface (GUI) operated through a touch sensitive surface (e.g., a resistive touch screen, surface acoustic wave touch screen, a capacitive sensing touch screen, an infrared touch screen, etc.). The GUI may be presenting instructional information via graphical instructions with minimal textual instructions. This may prove particularly useful in areas where many languages are expected  
25 to be commonly used and/or in areas where alphabetization is low.

[0093] The payment module 1020 may also further process at least one rental payment for maintaining the account on the charging station 1000. The account being properly maintained (e.g., by receiving periodic rental payments) may be a requirement of the authentication.

30 [0094] The account management module 1040 may also be used for managing a plurality of secondary accounts associated with the account. The input/output module 1050 may then be

used for allocating one or more of the charging credits to one or more of the secondary accounts.

**[0095]** The period of time may be considered ended (e.g., charging stops) when one or more of the following conditions are met:

5 **[0096]** - a timer expires;

**[0097]** - a quantity of energy has been provided;

**[0098]** - the battery-operated device is fully charged;

**[0099]** - the battery-operated device is disconnected;

10 **[00100]** - the battery-operated device is disconnected and a different battery-operated device is connected

**[00101]** - a door of the at least one receptacle is opened;

**[00102]** - the door of the at least one receptacle is unlocked; and

**[00103]** - more than one battery-operated device is connected within a single of the at least one receptacle.

15 **[00104]** The charging station may also comprise a network interface module 1060. The payment module 1020 may receive a confirmation of the processed payment through the network interface module 1060. The confirmation may further be received, through a cellular network, from:

**[00105]** - a credit card issuer;

20 **[00106]** - an online payment service provider;

**[00107]** - a prepaid card issuer;

**[00108]** - a mobile network operator; or

**[00109]** - a interbank transfer service.

25 **[00110]** A station management module 1070 may also be used for remotely monitoring the charging station through the network interface module 1060.

**[00111]** The station management module 1070 may be used for allowing at least one of:

**[00112]** - camera monitoring of the charging station and/or surroundings thereof;

**[00113]** - accelerometer monitoring of the charging station; and

**[00114]** - integrity monitoring of the charging station;

5 **[00115]** The station management module 1070 may be able to send network alerts, based on monitoring conditions, towards at least one of a law enforcement agency, a mobile operator, a charging station's owner, a registered charging station's user and/or a registered charging station's manager.

**[00116]** A plurality of charging ports may be provided for connecting the rechargeable  
10 battery operated device, within the receptacles 1010-1016, to the charging module 1030. The charging ports may comprise one or more, and in a preferred embodiment at least two, of:

**[00117]** - one or more Universal Serial Bus (USB) interfaces;

**[00118]** - a 120/240 VAC on 50/60 Hz interface;

**[00119]** - a proprietary power-pack charging interface; and

15 **[00120]** - one or more Power of Ethernet (PoE) interfaces.

**[00121]** At least one door (not shown) may be provided to lock the receptacle(s) 1010-1016. For instance, a single door may be used to cover all receptacles 1010-1016 and/or individual door(s) may be provided over some or all of the individual receptacles. Locking/unlocking of the door(s) may be controlled from the input/output module 1050 (i.e.  
20 keyless) or may require one or more physical keys. Action of the door may be used to account charging credits usage and/or control charging of the device 1100, 1200.

**[00122]** The charging module 1030 may measure a battery charge of the battery-operated device 1100 and/or calculate a current charge or charge time of the battery-operated device 1100. The charging module 1030 may visually indicate when the battery has been charged  
25 (e.g., through the input/output device 1050 and/or one or more LEDs associated with the relevant receptacle(s) 1010-1016).

**[00123]** In some embodiments, the network interface module 1060 may further provide a public Wireless Local Area Network (WLAN) access towards a cellular network. The

payment module 1020 may then also process one or more access payments for accessing the WLAN. The network interface module may further provide a Mobile Network Operator (MNO) network range extension functionality.

5 [00124] Figure 2 shows a flow chart of an exemplary method 2000 for charging a rechargeable battery-operated device 1100, in the charging station 1000 receiving electrical power from the local power generator 1040, in accordance with the teachings of the present invention. The method 2000 comprises receiving 2010 the rechargeable battery-operated device 1100 for connection into a receptacle 1010 of the charging station 1000, processing 2020 a payment for allowing the rechargeable battery-operated device 1100 to be charged for 10 a period of time and charging 2030 the rechargeable battery-operated device 1100 within the receptacle, in accordance with the processed payment.

[00125] Processing the payment 2020 may further comprise replenishing a balance of charging credits associated with an account, each of the charging credits allowing the rechargeable battery-operated device to be charged for the period of time.

15 [00126] Prior to charging 2030, the method 2000 may comprise allocating one or more of the charging credits to the receptacle 1010 and removing the allocated charging credits from the balance. Charging 2030 is then performed by activating a charging module for the receptacle 1010.

20 [00127] The method 2000 may also comprise authenticating into the account and, following the authentication, removing at least one allocated charging credit from the balance when a connection is established with the rechargeable battery-operated device 1100 within the receptacle 1010.

25 [00128] The method 2000 may also comprise processing at least one rental payment for maintaining the account on the charging station. The account being maintained may be a requirement of the authentication.

[00129] The method 2000 may also comprise managing a plurality of secondary accounts associated with the account and allocating one or more of the charging credits to one or more of the secondary accounts.

30 [00130] The method 2000 may also comprise receiving a confirmation of the processed payment through the network interface module 1060 of the charging station 1000.

[00131] The method 2000 may also comprise remotely monitoring the charging station 1100 through the network interface module 1100 by allowing at least one of:

[00132] - camera monitoring of the charging station and/or surroundings thereof;

[00133] - accelerometer monitoring of the charging station; and

5 [00134] - integrity monitoring of the charging station;

[00135] - wherein the method further comprises sending network alerts, based on monitoring conditions, towards at least one of a law enforcement agency, a mobile operator, a charging station's owner, a registered charging station's user and/or a registered charging station's manager.

10 [00136] The method 2000 may also comprise measuring a battery charge of the battery-operated device 1100, and/or calculating a charge time or charge of the battery-operated device 1100. The method 2000 may also comprise visually indicating when the battery has been charged.

[00137] Skilled person will readily understand that the exemplary method 2000 could also  
15 be provided for different devices in different receptacles without affecting the invention.

[00138] Even though explicit mentions of memory module and/or the processor module are not made throughout the description of the present examples, persons skilled in the art will readily recognize that such modules may be used in conjunction with other modules of the charging station 1000 to perform routine as well as innovative steps related to the present  
20 invention. The processor module may represent a single processor with one or more processor cores or an array of processors, each comprising one or more processor cores. The memory module may comprise various types of memory (different standardized or kinds of Random Access Memory (RAM) modules, memory cards, Read-Only Memory (ROM) modules, programmable ROM, etc.). A storage devices module may be present as one or more logical or  
25 physical as well as local or remote hard disk drive (HDD) (or an array thereof) or any other storage technology. The storage devices module may further represent a local or remote database made accessible by a standardized or proprietary interface. The network interface module 1060 represents at least one physical interface that can be used to communicate with other network nodes. The network interface module 1060 may be made visible to the other  
30 modules of the charging station 1000 through one or more logical interfaces. The actual stacks

of protocols used by the physical network interface(s) and/or logical network interface(s) of the network interface module 1060 do not affect the teachings of the present invention. The variants of processor module, memory module, network interface module and storage devices module usable in the context of the present invention will be readily apparent to persons  
5 skilled in the art.

**[00139]** Various network links may be implicitly or explicitly used in the context of the present invention. While a link may be depicted as a wireless link, it could also be embodied as a wired link using a coaxial cable, an optical fiber, a category 5 cable, and the like. A wired or wireless access point (not shown) may be present on the link between. Likewise, any  
10 number of routers (not shown) may be present and part of the link, which may further pass through the Internet.

**[00140]** The present invention is not affected by the way the different modules exchange information between them. For instance, the memory module and the processor module could be connected by a parallel bus, but could also be connected by a serial connection or involve  
15 an intermediate module (not shown) without affecting the teachings of the present invention.

**[00141]** A method is generally conceived to be a self-consistent sequence of steps leading to a desired result. These steps require physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic/electromagnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated.  
20 It is convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, parameters, items, elements, objects, symbols, characters, terms, numbers, or the like. It should be noted, however, that all of these terms and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. The description of the present invention has been presented for purposes of  
25 illustration but is not intended to be exhaustive or limited to the disclosed embodiments. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiments were chosen to explain the principles of the invention and its practical applications and to enable others of ordinary skill in the art to understand the invention in order to implement various embodiments with various modifications as might be suited to  
30 other contemplated uses.

## Claims

### What is claimed is:

- 1 1. A charging station comprising:
  - 2 - at least one receptacle for receiving at least one rechargeable battery-operated
  - 3 device to be charged;
  - 4 - a payment module for processing a payment for allowing one or more of the at
  - 5 least one rechargeable battery-operated device to be charged for a period of
  - 6 time; and
  - 7 - a charging module for charging the one or more of the at least one
  - 8 rechargeable battery-operated device within the at least one receptacle, in
  - 9 accordance with the processed payment, the charging module receiving
  - 10 electrical power from a local power generator.
- 1 2. The charging station of claim 1, wherein the at least one rechargeable battery-operated
- 2 device comprises a power pack device and a portable electronic device.
- 1 3. The charging station of claim 1 or claim 2 further comprising an account management
- 2 module for managing at least one account, wherein the payment replenishes a balance of
- 3 charging credits associated with the at least one account, each of the charging credits
- 4 allowing the one or more of the at least one rechargeable battery-operated device to be
- 5 charged for the period of time.
- 1 4. The charging station of claim 3 further comprising an input/output module for allocating
- 2 one or more of the charging credits to one or more of the at least one receptacle, the
- 3 account management module being further for removing the allocated charging credits
- 4 from the balance and activating the charging module for the one or more of the at least one
- 5 receptacle.
- 1 5. The charging station of claim 3 further comprising an input/output module for allowing
- 2 authentication into the at least one account and the account management module being
- 3 further for, following the authentication, removing at least one allocated charging credit
- 4 from the balance when a connection is established with the one or more of the at least one
- 5 rechargeable battery-operated device within the at least one receptacle.

- 1 6. The charging station of claim 5, wherein the payment module is further for processing at  
2 least one rental payment for maintaining the at least one account on the charging station,  
3 wherein the at least one account being maintained is a requirement of the authentication.
- 1 7. The charging station of claim 3, wherein the account management module is further for  
2 managing a plurality of secondary accounts associated with the at least one account, the  
3 charging station further comprising an input/output module for allocating one or more of  
4 the charging credits to one or more of the secondary accounts.
- 1 8. The charging station of any one of claims 1 to 7, wherein the period of time ends when one  
2 or more of the following conditions are met:
- 3 - a timer expires;
  - 4 - a quantity of energy has been provided;
  - 5 - the battery-operated device is fully charged;
  - 6 - the battery-operated device is disconnected;
  - 7 - the battery-operated device is disconnected and a different battery-operated  
8 device is connected
  - 9 - a door of the at least one receptacle is opened;
  - 10 - the door of the at least one receptacle is unlocked; and
  - 11 - more than one battery-operated device is connected within a single of the at  
12 least one receptacle.
- 1 9. The charging station of any one of claims 1 to 8 further comprising a network interface  
2 module, wherein the payment module receives a confirmation of the processed payment  
3 through the network interface module.

- 1 10. The charging station of claim 9 further comprising a station management module for  
2 remotely monitoring the charging station through the network interface module, the station  
3 management module allowing at least one of:
- 4 - camera monitoring of the charging station and/or surroundings thereof;
  - 5 - accelerometer monitoring of the charging station; and
  - 6 - integrity monitoring of the charging station;
  - 7 - wherein the station management module is capable of sending network alerts,  
8 based on monitoring conditions, towards at least one of a law enforcement  
9 agency, a mobile operator, a charging station's owner, a registered charging  
10 station's user and/or a registered charging station's manager.
- 1 11. The charging station of claim 9, wherein the confirmation is received, through a cellular  
2 network, from:
- 3 - a credit card issuer;
  - 4 - an online payment service provider;
  - 5 - a prepaid card issuer;
  - 6 - a mobile network operator; or
  - 7 - a interbank transfer service.
- 1 12. The charging station of any one of claims 1 to 11, wherein the local power generator  
2 comprises a solar generator integrated with a housing of the charging station.
- 1 13. The charging station of any one of claims 1 to 12, wherein the local power generator  
2 comprises a wind generator collocated with a housing of the charging station.
- 1 14. The charging station of any one of claims 1 to 13, wherein the local power generator is  
2 autonomous by being disconnected from the distribution grid.
- 1 15. The charging station of claim 4, claim 5 or claim 7, wherein the input/output module  
2 comprises a Graphical User Interface (GUI) operated through a touch sensitive surface.
- 1 16. The charging station of claim 15, wherein the GUI is for presenting instructional  
2 information via graphical instructions with minimal textual instructions.
- 1 17. The charging station of any one of claims 1 to 15, further comprising a plurality of  
2 charging ports adapted for connecting the rechargeable battery operated device, within the  
3 at least one receptacle, to the charging module.

- 1 18. The charging station of claim 16, wherein the plurality of charging ports comprise at least  
2 two of:
- 3 - one or more Universal Serial Bus (USB) interfaces;
  - 4 - a 120/240 VAC on 50/60 Hz interface;
  - 5 - a proprietary power-pack charging interface; and
  - 6 - one or more Power of Ethernet (POE) interfaces.
- 1 19. The charging station of any one of claims 1 to 18 further comprising at least one door to  
2 lock the at least one receptacle.
- 1 20. The charging station of any one of claims 1 to 19, wherein the charging module is further  
2 for measuring a battery charge of the battery-operated device.
- 1 21. The charging station of any one of claims 1 to 20, wherein the charging module is further  
2 for calculating a charge time of the battery-operated device.
- 1 22. The charging station of claim 20 or claim 21, wherein the charging module is further for  
2 visually indicating when the battery has been charged.
- 1 23. The charging station of any one of claims 9 to 22, whenever dependent on claim 9,  
2 wherein the network interface module is further for providing a public Wireless Local  
3 Area Network (WLAN) access towards a cellular network, wherein the payment module is  
4 further for processing one or more access payments for accessing the WLAN.
- 1 24. The charging station of any one of claims 9 to 23, whenever dependent on claim 9,  
2 wherein the network interface module is further for providing Mobile Network Operator  
3 (MNO) network range extension functionality.
- 1 25. A method for charging a rechargeable battery-operated device comprising:
- 2 - receiving the rechargeable battery-operated device for connection into a  
3 receptacle of a charging station, the charging station receiving electrical power  
4 from a local power generator;
  - 5 - processing a payment for allowing the rechargeable battery-operated device to  
6 be charged for a period of time; and
  - 7 - charging the rechargeable battery-operated device within the receptacle, in  
8 accordance with the processed payment.

- 1 26. The method of claim 25, wherein the rechargeable battery-operated device is a power pack  
2 device or a portable electronic device.
- 1 27. The method of claim 25 or claim 26, wherein processing the payment further comprises  
2 replenishing a balance of charging credits associated with an account, each of the charging  
3 credits allowing the rechargeable battery-operated device to be charged for the period of  
4 time.
- 1 28. The method of claim 27 further comprising, prior to charging, allocating one or more of  
2 the charging credits to the receptacle and removing the allocated charging credits from the  
3 balance, wherein charging is performed by activating a charging module for the receptacle.
- 1 29. The method of claim 27 further comprising authenticating into the account and, following  
2 the authentication, removing at least one allocated charging credit from the balance when a  
3 connection is established with the rechargeable battery-operated device within the  
4 receptacle.
- 1 30. The method of claim 29, further comprising processing at least one rental payment for  
2 maintaining the account on the charging station, wherein the account being maintained is a  
3 requirement of the authentication.
- 1 31. The method of claim 27, further comprising managing a plurality of secondary accounts  
2 associated with the account and allocating one or more of the charging credits to one or  
3 more of the secondary accounts.

1 32. The method of any one of claims 25 to 31, wherein the period of time ends when one or  
2 more of the following conditions are met:

- 3 - a timer expires;
- 4 - a quantity of energy has been provided;
- 5 - the battery-operated device is fully charged;
- 6 - the battery-operated device is disconnected;
- 7 - the battery-operated device is disconnected and a different battery-operated  
8 device is connected
- 9 - a door of the at least one receptacle is opened;
- 10 - the door of the at least one receptacle is unlocked; and
- 11 - more than one battery-operated device is connected within a single of the at  
12 least one receptacle.

1 33. The method of any one of claims 25 to 32 further comprising receiving a confirmation of  
2 the processed payment through a network interface module of the charging station.

1 34. The method of claim 33 further comprising remotely monitoring the charging station  
2 through the network interface module by allowing at least one of:

- 3 - camera monitoring of the charging station and/or surroundings thereof;
- 4 - accelerometer monitoring of the charging station; and
- 5 - integrity monitoring of the charging station;
- 6 - wherein the method further comprises sending network alerts, based on  
7 monitoring conditions, towards at least one of a law enforcement agency, a  
8 mobile operator, a charging station's owner, a registered charging station's  
9 user and/or a registered charging station's manager.

- 1 35. The method of claim 33, wherein the confirmation is received, through a cellular network,  
2 from:
- 3 - a credit card issuer;
  - 4 - an online payment service provider;
  - 5 - a prepaid card issuer;
  - 6 - a mobile network operator; or
  - 7 - a interbank transfer service.
- 1 36. The method of any one of claims 25 to 35, wherein the local power generator comprises a  
2 solar generator integrated with a housing of the charging station.
- 1 37. The method of any one of claims 35 to 36, wherein the local power generator comprises a  
2 wind generator collocated with a housing of the charging station.
- 1 38. The method of any one of claims 25 to 37, wherein the local power generator is  
2 autonomous by being disconnected from the distribution grid.
- 1 39. The method of claim 28, claim 29 or claim 31, further comprising providing a Graphical  
2 User Interface (GUI) operated through a touch sensitive surface.
- 1 40. The method of claim 39, wherein the GUI is for presenting instructional information via  
2 graphical instructions with minimal textual instructions.
- 1 41. The method of any one of claims 25 to 40, further comprising providing a plurality of  
2 charging ports adapted for connecting the rechargeable battery operated device, within the  
3 receptacle.
- 1 42. The method of claim 41, wherein the plurality of charging ports comprise at least two of:
- 2 - one or more Universal Serial Bus (USB) interfaces;
  - 3 - a 120/240 VAC on 50/60 Hz interface; and
  - 4 - a proprietary power-pack charging interface; and
  - 5 - one or more Power of Ethernet (POE) interfaces.

43. The method of any one of claims 25 to 42 further comprising providing at least one door to lock the receptacle.
44. The method of any one of claims 25 to 43, further comprising measuring a battery charge of the battery-operated device.
- 5 45. The method of any one of claims 25 to 44, further comprising calculating a charge time of the battery-operated device.
46. The method of claim 44 or claim 45, further comprising visually indicating when the battery has been charged.
- 10 47. The method of any one of claims 33 to 46, whenever dependent on claim 33, further comprising providing a public Wireless Local Area Network (WLAN) access towards a cellular network and processing one or more access payments for accessing the WLAN.
48. The method of any one of claims 33 to 46, whenever dependent on claim 33, further comprising providing Mobile Network Operator (MNO) network range extension functionality.

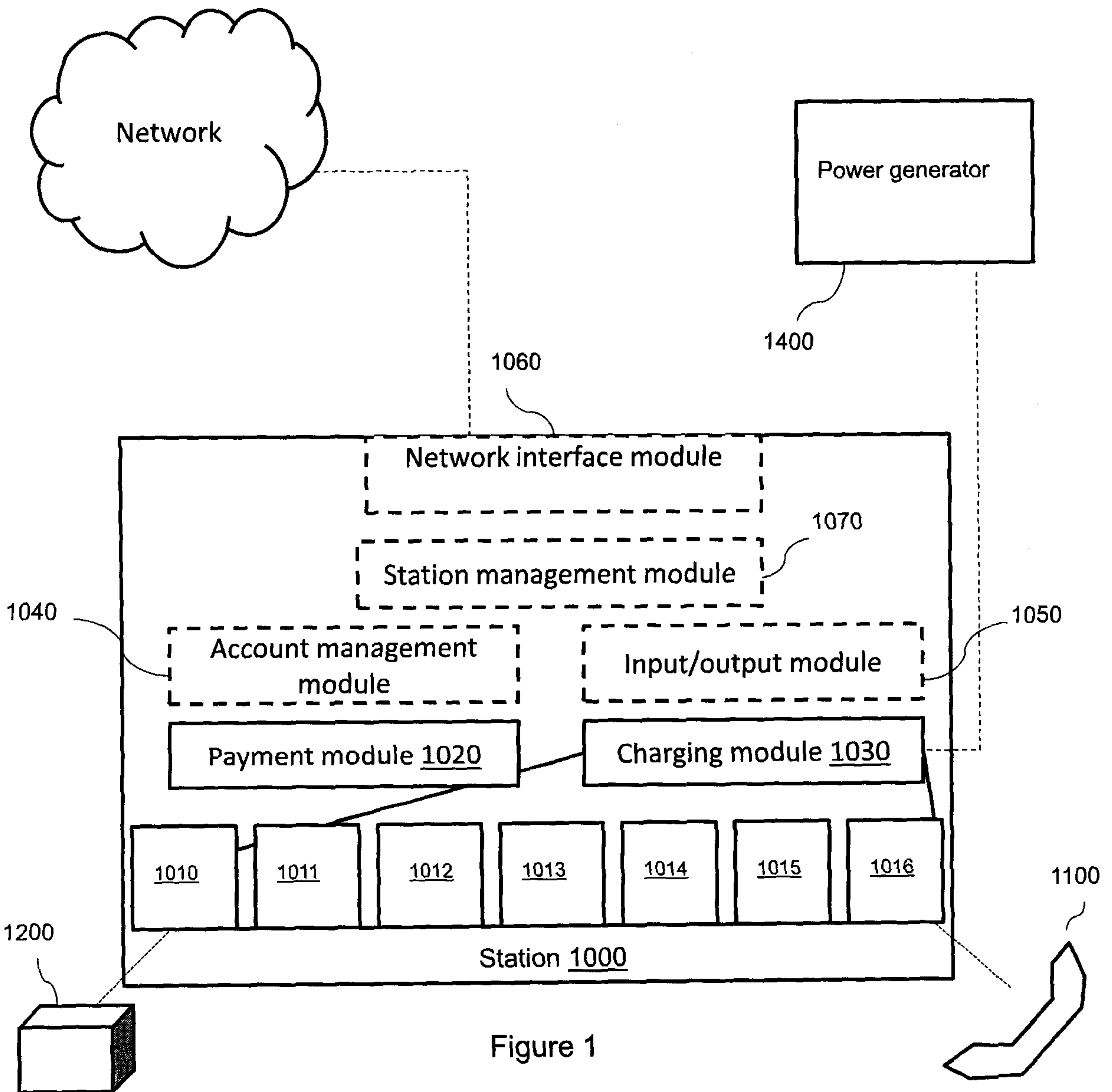


Figure 1

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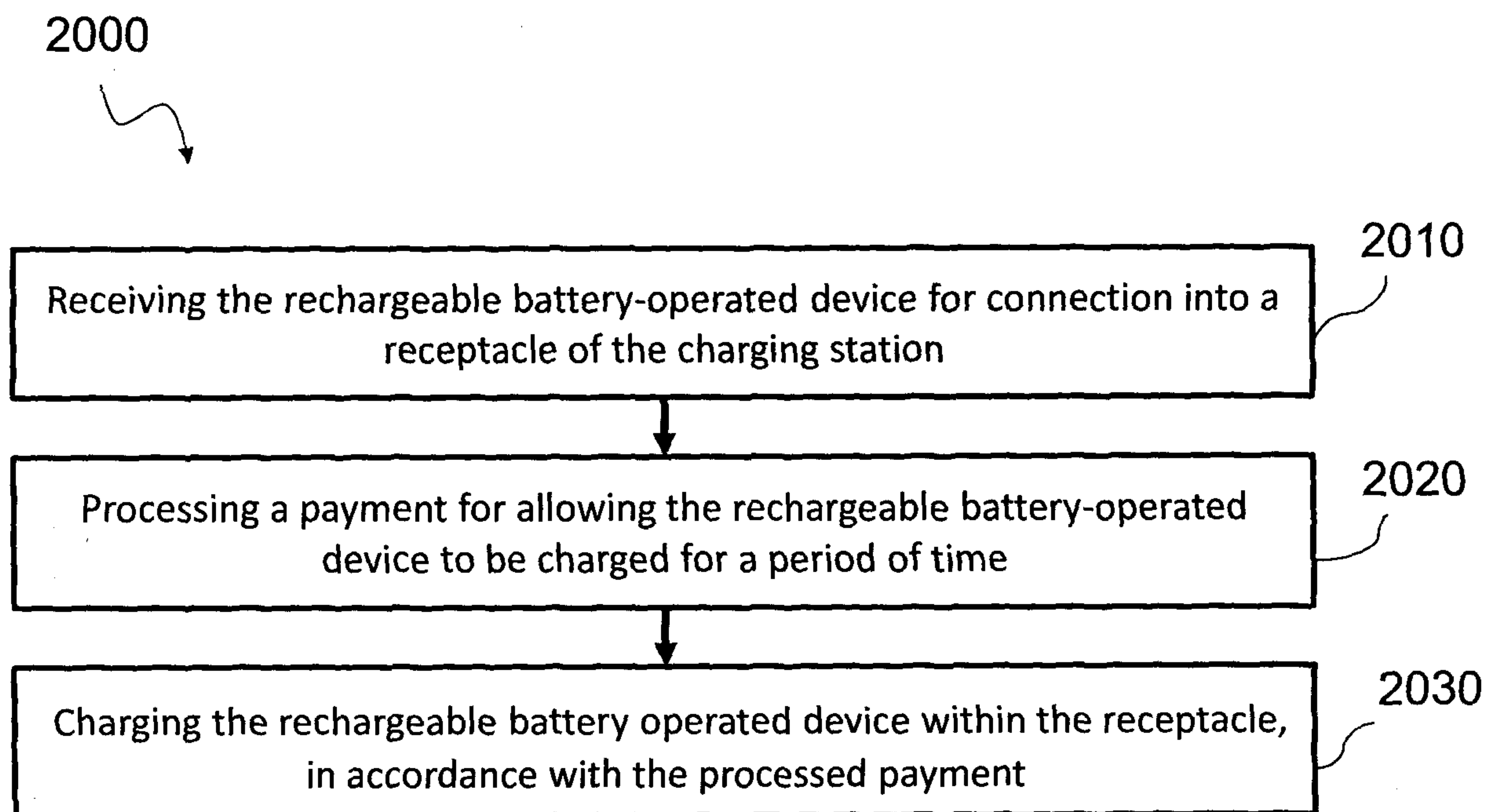


Figure 2

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## Figure 2

