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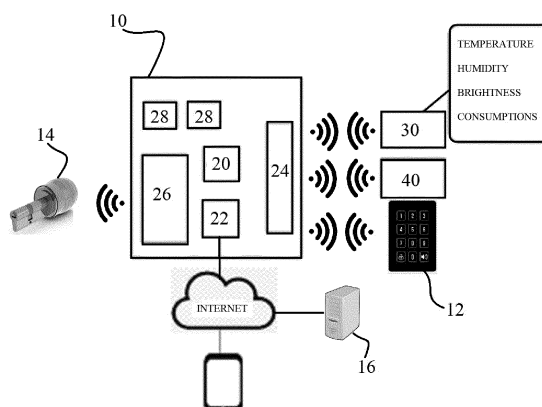
(54) **AUTOMATIC SYSTEM FOR MONITORING AND MANAGING TEMPORARY LEASES OF REAL ESTATE PROPERTY**

(57) An automatic system for monitoring and managing temporary leases of real estate property, comprising:

- an apparatus (10) for local management and control of the system, said apparatus being designed to be installed inside the real estate property;
- a wireless keypad (12) with an on-board memory, preferably a membrane keypad and preferably battery-operated, said keypad being designed to be installed outside the real estate property, typically on the entrance door or adjacent thereto, and being connected to said apparatus (10);

- a battery-operated, remote controllable motorized cylinder (14) for unlocking/locking the door;
- a server (16) for global management and monitoring of the system via a web application that comprises at least one module adapted to automatically generate an access code, during booking, which is only valid for the duration of the lease, said access code being stored and periodically updated, by said apparatus (10), in the memory of the keypad (12).

Fig. 1



Description

[0001] The present invention relates to an automatic system for monitoring and managing temporary leases of real estate property, especially for short periods.

[0002] Short-term leases of apartments, typically lasting a few days at most, are known to find increasing success. Due to the capillarity of telematic connectivity and the development of web sites that advertise apartments, this kind of non-hotel accommodation has become widespread.

[0003] Users who choose this kind of accommodation are constantly increasing, as well as the available apartments, especially in cities of art. An increasing number of apartment owners are choosing to use this new mode of availability of their apartments in the market, in view of solving the problems of long-term leases, such as late payments, conflicts with the tenants, failure to vacate the property, etc.

[0004] Nevertheless, temporary leases, especially short-term leases, involve several tasks such as, to mention but a few, ensuring on-time reception of guests and delivery of the apartment as well as perfect efficiency and frequent cleaning, fulfilling guests' needs, completing the paperwork required in this kind of contract, e.g. transferring guests' personal data to the authorities and paying tourist taxes, managing the return of the apartment at the end of the lease. Owners do not generally have the time to carry out all these tasks on their own, because the lease is often their side business and must rely on employees or service agencies, at the expense of profitability and safety.

[0005] Furthermore, the quality and timeliness of services are essential to obtain good feedback from customers and increase the turnover for the apartment. Various solutions have been suggested to allow owners to carry out at least some of the aforementioned tasks from a remote location, i.e. without having to be physically present at the apartment being leased.

[0006] WO2012116400A1 discloses a reservation system for managing access to controlled locations by issuing an access code that is valid at a particular lock for a particular interval of time. The reservation system includes a standalone lock that has a processor, a clock and a memory. The processor of the lock checks an access code entered at a given time against the access codes stored in the memory to determine if they are valid for the given time provided by the clock.

[0007] Prior art solutions are not entirely satisfactory and reliable and restrict management to a few tasks associated with the lease.

[0008] The object of the present invention is to provide an automatic system for monitoring and managing all the steps of a temporary lease of a real estate property.

[0009] This object is fulfilled by a system as defined in the appended claims.

[0010] In particular, a system of the invention allows completion of all the main tasks associated with the lease

without being physically present, and namely ensures fully automatic management of the following tasks:

- Check in and check out
- Transfer of documents to the police headquarters
- Tourist tax payment
- Handbooks of the house
- Tourist guide
- Emergency management
- HVAC
- Power saving

[0011] The advantages of the invention, as well as its technical features, will be more clearly explained in the following detailed description of a preferred, nonlimiting exemplary embodiment, as schematically shown in the accompanying Figure 1.

[0012] A system of the present invention comprises:

- an apparatus (gateway) 10 for local management and control of the system, said apparatus being designed to be installed inside the apartment;
- a wireless keypad 12, preferably a membrane keypad having an on-board memory and preferably battery-operated, said keypad being designed to be installed outside the apartment, typically on the entrance door or adjacent thereto;
- a battery-operated, remote controllable motorized cylinder 14 for unlocking/locking the door;
- a server 16 for global management and control of the system via a web application.

[0013] In particular, the gateway 10 comprises:

- a microprocessor control unit 20;
- an Ethernet or Wi-Fi connection unit 22 for connection to the Internet;
- a LoRa wireless communication unit 24;
- a unit 26 for remote control of the motorized cylinder 14.

[0014] The gateway 10 also comprises at least one pair of actuators 28 for unlocking/locking the door if the latter is equipped with an electric lock instead of a remote controllable motorized cylinder.

[0015] The memory of the keypad 12 stores multiple access codes, via the gateway 10, and as they are correctly entered the motorized cylinder 14 is actuated by the gateway, thereby unlocking the door.

[0016] In particular, the keypad stores:

- a first access code for use by the guest, said first code being automatically generated by the application at the time of booking of the stay, and expiring at the end of the stay,
- at least one second code selected by the owner, with or without expiration, for his/her own use or for use

by persons authorized by him/her, and

- at least one third code that expires immediately after its use, for example, to allow access to the apartment in case of emergency.

[0017] In a preferred embodiment of the system, there are three owner-selected codes.

[0018] In a further preferred embodiment, the system comprises a RFIC card reader, preferably incorporated in the keypad 12, and the first access code is valid only once to enable subsequent accesses only with a RFID card initially placed inside the apartment in a smart power-saving pocket which is known in the art. A plurality of wireless sensors 30 is advantageously provided for monitoring environmental parameters and power consumption.

[0019] In addition, actuator modules 40 may be provided for automatic and/or application-based management of various devices, such as electric strikes, electric locks, additional motorized cylinders, lights, thermostats, motorized rolling shutters and blinds, irrigation systems, on/off switches of household appliances.

[0020] The web application installed in the server 16 comprises a user interface (portal), which is adapted to identify a user that has the credentials automatically assigned by the system at the time of booking and to provide all the information given by the owner of the apartment in which the user has booked his/her stay.

[0021] The credentials are managed by the server through a module of the application that communicates with the major booking portals, thereby releasing the owner of the apartment from this task. Using the application, the owner inputs the information that he/she deems necessary to improve the experience of his/her guest into the portal. The information may be enriched with pictures, descriptions and external links.

[0022] In addition to the information on the portal, automatic services are also provided to assist the owner, such as recording by the host of the information to be transferred to the police headquarters and payment of tourist taxes. The application also comprises a module for direct door unlocking/locking control through the gateway.

[0023] In short, a system in accordance with the invention affords monitoring and managing of the apartment without requiring the presence of the owner, and allows the guest to comfortably enjoy his/her stay without the help of other people.

[0024] Thus, with the system the guest can access the apartment, receive all the necessary information about the location and way of use of all the objects and services available therein, benefit from tips and advice about services outside the apartment, have at hand useful numbers for any emergency.

[0025] Also, with the present invention the owner can avoid the need to be present during check-in and check-out, manage unique access codes for the cleaning or maintenance staff, manage one-time codes for cases of

emergency, have personal codes.

[0026] The system also:

- manages automatic door locking even without the guest taking action;
- affords temperature control in the apartment according to the reservations and window opening, and shuts off unnecessary utilities at check-out, thereby providing power savings and, when using power saving pockets, shuts off the utilities each time the room is left;
- provides the ability to receive open door/window, water leakage or electrical fault alarm messages.

[0027] The peculiar aspects of the management of typical tasks associated with short-term leases will be described below.

1. Check in and check out.

[0028] The system allows the guest to access using a typing code instead of keys. The specially designed module of the web application periodically checks all the reservations of the registered apartments.

[0029] As soon as a reservation is received, a unique code is assigned thereto for tracking and tracing the operation, and a fixed term seven-digit code is generated according to a time-based algorithm, to enable access to the apartment. The access code is sent to the email address indicated by the user during booking.

[0030] The mail also includes the link to the web application containing all the information created by the owner of the apartment: apartment handbook, information, useful numbers, etc.

[0031] As soon as the keypad is turned on, it is updated with the data on the gateway and checks for updates on currently valid codes. As the correct code is typed, a control will be sent for opening the motorized cylinder that will unlock the door.

[0032] Thus, the owner will not be required to change the codes and communicate them, because the codes are updated even though no power and/or Internet connection are present in the apartment as the guest arrives. All the necessary devices have a battery-powered, wireless operation.

[0033] At check-out the system automatically locks the door and shuts-off the utilities, as explained below.

2. 2. Transfer of documents to the police headquarters

[0034] As the guest first accesses the web application, he/she is required to fill in the personal data required for identification, which is then transferred, in compliance with the regulations in force for every short-term lease that is being entered into.

3. Tourist tax payment

[0035] If the property is located in a town to which the tourist tax is not levied by the booking site, guests will find the calculation of the amount due directly on the application and may decide to use an electronic payment mode, by selecting a button in the application or pay in another manner.

[0036] The owner of the apartment is thus exempted from this task.

4. Handbooks of the house

[0037] Through the web application the owner provides the guest with all the information about the rules of the house and the operation of the household appliances that he/she will find therein.

[0038] For optimized guest satisfaction, the information is classified into categories, with detailed descriptions and pictures. The owner prepares this virtual space dedicated to the apartment with the desired degree of accuracy to allow the guest to make the best use of the apartment, with any information promptly and easily available.

5. Tourist guide

[0039] The web application contains a space dedicated to places to visit, where to eat, how to get around in town, etc.

[0040] The information is classified into categories that can be selected using icons and intuitive buttons that can allow even a foreign guest to easily retrieve information of interest.

[0041] Thus, the owner of the apartment can easily provide an additional service, by setting the points of interest in the same manner as the categories of the handbook of the house, and enrich them at will with more or less detailed descriptions, pictures or links.

6. Emergency management

[0042] Using the sensors 30, the gateway 10 detects any anomaly (doors/windows left open, flooding due to leakage or a tap that has been inadvertently left open, break-ins, etc.) and notifies the server 16 or carries out previously arranged operations.

[0043] The owner always receives the notification of what has happened and can promptly take actions to avoid or limit damage to the apartment.

7. HVAC

[0044] Among the available devices, the system may also include a thermostat capable of checking the boiler or an actuator that can switch on/off a HVAC device. Once the parameters have been set on the server 16, each apartment is managed according to these settings

via the gateway 10. The thermostat may be set to operate according to weekly schedules or with a preset temperature.

[0045] The boiler or the HVAC apparatus are switched off or on to consistently maintain the desired temperature, according to the period of the year, the detected outside temperature and the reservations.

[0046] By this arrangement, the owner of the apartment may achieve power savings, because the apartment is consistently managed with the ideal temperature and provide comfort to his/her guest, without having to personally check the temperature of the apartment. Furthermore, the system is managed according to the reservations and turns off when no arrivals are expected.

8. Power saving

[0047] The system manages the unnecessary utilities, by disabling them at check-out, turning off the HVAC devices if windows are open and possibly limiting the use of the utilities or charging additional costs.

[0048] By this arrangement, the owner of the apartment will save on energy bills, and avoid waste due to careless management by the guest especially in the use of HVAC devices and lights. Furthermore, by shutting off the unnecessary utilities at check-out, the household appliances are further protected from any failure due to current surges or short circuits.

Claims

1. An automatic system for monitoring and managing temporary leases of real estate property, comprising:

- an apparatus (10) for local management and control of the system, said apparatus being designed to be installed inside the real estate property;
 - a wireless keypad (12) with an on-board memory, preferably a membrane keypad and preferably battery-operated, said keypad being designed to be installed outside the real estate property, typically on the entrance door or adjacent thereto, and being connected to said apparatus (10);
 - a battery-operated, remote controllable motorized cylinder (14) for unlocking/locking the door;
 - a server (16) for global management and control of the system via a web application;
- said apparatus (10) comprising:

- a microprocessor control unit (20);
- an Ethernet or Wi-Fi connection unit (22) for connection to the Internet;
- a LoRa wireless communication unit (24);
- a unit (26) for remote control of the motorized cylinder (14);

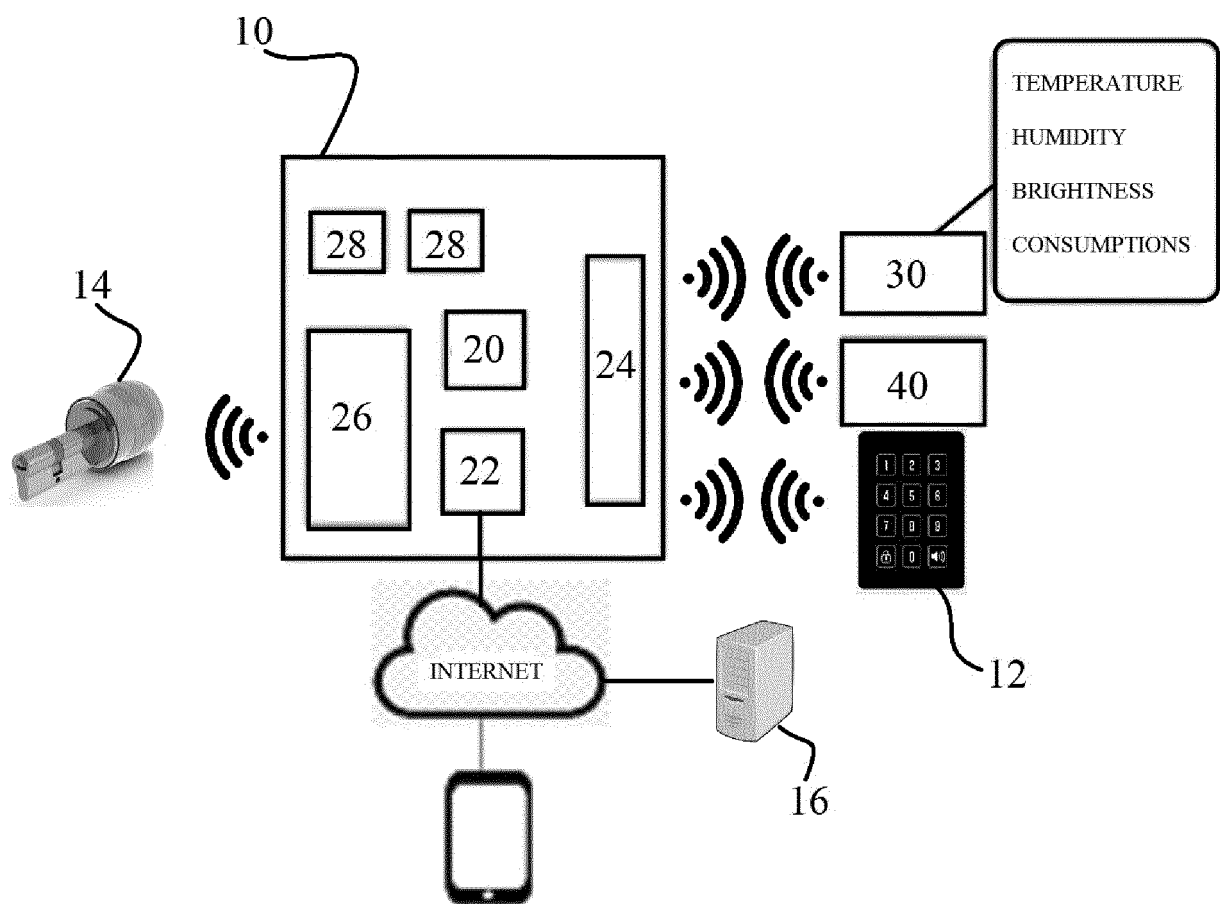
said web application comprising at least one module adapted to automatically generate an access code, at the time of booking, that is only valid for the term of the lease,

said access code being stored and periodically updated in the memory of the keypad (12) by said apparatus (10). 5

2. A system as claimed in claim 1, wherein a RFIC card reader is provided, and is preferably incorporated in the keypad (12), and the first access code is valid only once to enable subsequent accesses only with a RFID card initially placed inside the apartment in a smart power-saving pocket. 10
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3. A system as claimed in claim 1, wherein the memory of the keypad (12) stores multiple access codes, and as they are correctly entered the motorized cylinder (14) is actuated by the apparatus (10) thereby unlocking the door. 20
4. A system as claimed in claim 3, wherein the keypad (12) stores at least one second code selected by the owner, with or without expiration, and at least one third code that expires immediately after its use. 25
5. A system as claimed in any of the preceding claims, wherein said apparatus (10) comprises at least one pair of actuators (28) for unlocking/locking the door if the latter is equipped with an electric lock instead of a remote controllable motorized cylinder. 30
6. A system as claimed in any of the preceding claims, wherein a plurality of wireless sensors (30) connected to the apparatus (10) are provided for monitoring environmental parameters and power consumption. 35
7. A system as claimed in any of the preceding claims, wherein a plurality of actuators (40) are provided for automatic management and/or application of various devices such as lights, thermostats, motorized rolling shutters and blinds, irrigation systems, on/off switches of household appliances. 40
8. A system as claimed in any of the preceding claims, wherein said web application installed in the server (16) comprises a portal which is adapted to identify a user having credentials automatically assigned by the system at the time of booking and to provide all the information given by the owner the real estate property being rented. 45
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Fig. 1





EUROPEAN SEARCH REPORT

Application Number
EP 20 16 0268

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2012/116400 A1 (LEAPIN PTY LTD [AU]; DUNN STEPHEN MARK [AU]) 7 September 2012 (2012-09-07) * the whole document *	1,3,6-8	INV. G07C9/00 E05B47/06
A	----- US 2017/002586 A1 (LEE DOMINICK S [US]) 5 January 2017 (2017-01-05) * the whole document *	2,4,5	
A	----- US 10 134 212 B1 (REN MARGARET [US] ET AL) 20 November 2018 (2018-11-20) * the whole document *	1-8	
A	----- US 10 134 212 B1 (REN MARGARET [US] ET AL) 20 November 2018 (2018-11-20) * the whole document *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			G07C E05B
Place of search		Date of completion of the search	Examiner
The Hague		13 July 2020	Ansel, Yannick
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 16 0268

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012116400 A1	07-09-2012	AU 2012222859 A1	10-10-2013
		CN 103548060 A	29-01-2014
		EP 2681387 A1	08-01-2014
		US 2013024222 A1	24-01-2013
		WO 2012116400 A1	07-09-2012

US 2017002586 A1	05-01-2017	NONE	

US 10134212 B1	20-11-2018	US 10134212 B1	20-11-2018
		US 10629014 B1	21-04-2020

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2012116400 A1 [0006]