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(54) Electrical door lock system with a lock, an input panel and an indicator panel forming a single integrated structure

(57) A smart and compact electrical lock system (1) comprising a PCB card having a microprocessor, a memory and a real time clock circuit, a lock having a latch and an electrical or electromagnetic driving means for driving said latch, and a reader (2) for association with a digital access card having a memory, such that, in use, said reader (2) reads data on the memory of said access card and grants access based on validity of said data; and said reader (2) is in electric connection with said driving means for actuating it, wherein said lock system (1) further comprises an input panel (3) for entering a user input, and an indicator panel (4) in electrical connection with said input panel (3) for indicating said user input; said lock system further comprises an alphanumerical and/or graphical display (5); and said lock, input panel (3) and indicator panel (4) are combined in a single integrated structure.

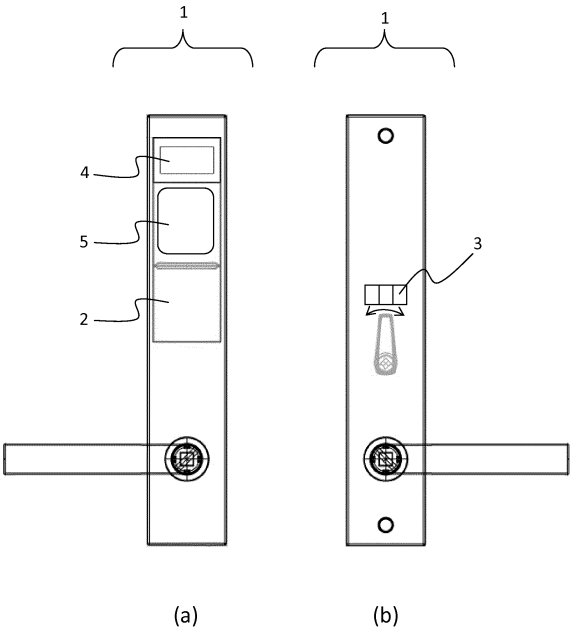

FIGURE 1

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Description

Technical Field of the Invention

[0001] The present invention relates to a smart and compact lock system having an input panel and an indicator panel combined in a single integrated structure.

Background of the Invention

[0002] Especially in hotels, indication of room status and requests of guests accommodated in such rooms are conventionally performed using door hangers. Door hangers are difficult to control, and intentional or unintentional removal of said door hangers from door knobs result in unwanted situations such as infringement of privacy, or failing to housekeep. For eliminating such problems related to door hangers, lock systems which function in coordination with indicator and input panels are required.

[0003] In the indicator panels of the prior art, production and installation cost problems due to the requirement consisting several parts and to the difficulties with the installation of electrical connections and cables for feeding said parts, should be eliminated.

[0004] By some lock systems on the market, which are associated with access cards, which are usually employed at doors of hotel rooms, offices, residences etc., room number, room status, or access status related with a certain access card are not visually indicated. In addition to the abovementioned shortcomings related to installation difficulties and reduced lifespan, said systems lack to provide some useful and informative interface services such as personalized messages associated with a certain user having the authorization to use said certain access card. There is a need to enhance the user interface abilities of such lock systems.

[0005] Additionally, in current lock systems, information on access cards are neither user nor time-related. This limits the usefulness of such systems, since once-loaded and non-updated information on an access card results in limitations in availability of news and utilization of some services provided by a facility, thus it causes loss of any synergy and efficiency.

[0006] Besides, such lock systems on the market lack comfortable and practical use by requiring a user to personally be in proximity of said system for utilizing said lock systems.

Objects of the Invention

[0007] Primary object of the present invention is to overcome the abovementioned shortcomings of the prior art.

[0008] Another object of the present invention is to provide a smart and compact lock system, wherein it is possible to install a lock, an input panel and an indicator panel into a single slot on a door wing, with minimized installation and production costs.

[0009] Further an object of the present invention is to provide a lock system with enhanced user interface abilities.

[0010] Another object of the present invention is to provide a lock system offering useful and enhanced, communication with up-to-date information, between a user and a centralized system.

[0011] Yet another object of the present invention is to provide a lock system which is comfortable and practical to use, without requiring a user to personally be in proximity of said system for utilizing it.

Summary of the Invention

[0012] A smart and compact electrical lock system, said system comprising a PCB card having a microprocessor, a memory and a real time clock circuit, a lock having a latch and an electrical or electromagnetic driving means for driving said latch, and a reader for association with a digital access card having a memory, such that, in use, said reader reads data on the memory of said access card and grants access based on validity of said data; and said reader is in electric connection with said driving means for actuating it, wherein said system further comprises an input panel for entering a user input, and an indicator panel in electrical connection with said input panel for indicating said user input; said lock system further comprises an alphanumerical and/or graphical display and said lock, input panel and indicator panel constitute a single integrated structure.

Brief Description of the Figures

[0013] The figures whose brief explanations are herewith provided are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is to be interpreted in the absence of the description.

[0014] Figure 1 (a) and (b) schematically demonstrate two sides of a lock system according to the present invention; (a) the side provided with an indicator panel, and (b) the side with an input panel.

Detailed Description of the Invention

[0015] Referring now to the figures outlined above, the present invention is detailedly described hereinbelow. The reference numbers used in the figures are as follows:

1. Lock system according to the present invention
2. Reader
3. Input panel
4. Indicator panel
5. Alphanumerical or graphical display

[0016] The present invention proposes a smart and

compact electrical lock system (1) comprising a PCB card having a microprocessor, a memory and a real time clock circuit, said lock system (1) further comprises a lock having a latch and an electrical or electromagnetic driving means for driving said latch, and a reader (2) for association with a digital access card having a memory, such that, in use, said reader (2) reads data on the memory of said access card and grants access based on validity of said data; and said reader (2) is in electric connection with said driving means for actuating it, wherein said lock system (1) further comprises an input panel (3) for entering user input, and an indicator panel (4) in electrical connection with said input panel (3) for indicating said user input; said lock system further comprises an alphanumerical and/or graphical display (5), and said lock, input panel (3) and indicator panel (4) are combined in a single integrated structure.

[0017] By being said lock, input panel (3), and indicator panel (4) combined in a single integrated structure according to the present invention, it is possible to install said lock system (1) into a single slot on a door wing, thus the installation and production costs of said lock system (1) are minimized. Furthermore, with the lock system (1) according to the present invention, difficulties and imperfections due to complex wirings and production/installation costs in the lock systems of the prior art combining individual locks with input and indicator panels are eliminated.

[0018] The lock system (1) according to the present invention is suitable to be employed in doors of hotel rooms, and offices.

[0019] Said digital access card can be a keycard, or another device with data/information bearing ability, said data is to be loaded using a single or centralized device utilized by e.g. a hotel management. Data on said access card can be read by said reader (2) with or without contacting said key to said reader (2).

[0020] The memory of said access card is updateable. Data thereon preferably comprises one or more of the followings: information about a user; and the authorization type or status for said user; booking status of a room provided with a lock associated with said access card. Said data preferably further comprises one or more of the followings: announcement(s) to be transmitted to the user via an associated lock system (1) such as any events organized by the authority updating said memory, a part of weather report, etc. Thus, said lock system (1) has enhanced user interface abilities.

[0021] Said access card can also be used in digital verification of authorization at purchasing goods and/or utilization of /access to services at any facility related with e.g. a hotel; and data thereon is automatically updated along with said verification process. Data may also include outdoor weather conditions, sea water temperature, or any occasions/events/discounts organized/provided by e.g. a hotel; and such data on said access card can selectively or automatically be displayed on said indicator panel (4).

[0022] With said alphanumerical or graphical display (5), a message can appear thereon to be seen by a user using said access card on said lock system (1), e.g. by a hotel guest. Preferably, in use, said indicator panel (4) displays information and/or a message digitally loaded on said access card. Preferably, said indicator panel (4), in use, also displays information and/or a message digitally loaded on said memory on said PCB card. Said information can be a message such as a salutation message preferably including the name of the user, time of the day, date, remaining duration of stay, or another message from the reception unit of a hotel etc. Thus, said lock system (1) provides useful and enhanced centralized communication to a user. Date and/or time of the lock system (1) can be viewed, controlled and when necessary, easily updated by a person e.g. an authorized staff using a specific-purpose unit, e.g. a 'master' access/maintenance card.

[0023] Said message can further target someone besides the user, e.g. an employee of a hotel; and it can be also a message chosen to be any of those on typical hotel door hangers e.g. 'clean the room', a 'do not disturb', 'out of order', 'change the bed linens', etc. In case of said display (5) is graphical, also graphical images can be viewed on said display as well as alphanumerical messages, e.g. still or animated images symbolizing above messages, a logo etc. Said information or message can be selected or entered through said input panel (3) or an external communication unit in communication with the lock system (1).

[0024] In another preferred embodiment according to the present invention, also said indicator panel (4) is an alphanumerical or graphical display.

[0025] In a preferred embodiment according to the present invention, the lock system (1) is battery powered. Thus, any need of electrical power wiring and related additional installation costs are eliminated. In a further preferred embodiment according to the present invention, said indicator panel (4) displays the status of said battery, e.g. a verbal or graphical warning indicating that the battery is required to be changed. Said indication is preferably viewable by an authorized person upon proof of authorization e.g. using a master access card providing authorization which is valid on a plurality of such lock systems (1), to an employee of a hotel, e.g. technician or housekeeper. By this embodiment, status of a battery used in the lock system (1) can be precisely followed, and the battery can be changed when needed. Thus, storage need for spare batteries is eliminated. Since batteries lose their energy charge (in mAh) during their shelf lives, prolonged storage causes efficiency loss for each battery, and batteries serve shorter and inefficiently. Thus, by this embodiment, batteries are able to serve with a maximized efficiency, battery storage costs are minimized.

[0026] In another preferred embodiment according to the present invention, said lock system (1) further comprises a motion and/or proximity sensor. By employing a

motion and/or proximity sensor, the lock system (1) and the indicator panel (4) and/or display can enter to a 'sleep' or 'standby' mode after a time interval when said sensor lacks triggering by any motion/approaching from outside, and exit from said mode when someone approaches to/moves within the incidence of said sensor. Thus, the battery life is prolonged by reducing the energy consumption of the lock system (1).

[0027] In another preferred embodiment according to the present invention, said lock system (1) comprises a cylinder lock for manually driving said latch. This enables the lock and thus the latch can be manually accessed, which is necessary in case of running out of said battery or any failure of said reader (2) or said electrical or electromagnetic means for driving the latch.

[0028] In another preferred embodiment according to the present invention, said lock system (1) comprises a speaker for playing sound signals, voice records and/or text-to-speech messages. This feature is useful for visually challenged people, as well as in case of failure of the indicator panel (4) and/or said alphanumerical and/or graphical display. Said sound signals, voice records and/or text-to-speech messages can be generated or selected by a list of records which can be saved on at least one of said memories (the memory on said PCB card, or on said access card), by said microprocessor. In another preferred embodiment according to the present invention, said input panel (3) comprises embossment(s) for use by visually challenged people.

[0029] In another preferred embodiment according to the present invention, said lock system (1) is associated with an external communication unit which is, in use, in communication with said electrical or electromagnetic driving means and/or input panel (3). Said external communication unit is preferably a remote control or near field communication unit. This feature provides a comfortable and practical use of said lock system (1) without requiring a user to personally be in proximity of said lock system (1) for utilizing it, i.e. for locking said door or for entering input to said input panel (3).

[0030] In another preferred embodiment according to the present invention, the lock system (1) further comprises a wireless communication device. With said communication device, centralized commands can be delivered to the lock system (1) via an external device which is in connection which is wireless thus not requiring any wire. Any above explained behavior of the lock system (1), such as any changes on the authorization status of a certain access card can be controlled using said commands. The term 'centralized' here means that said commands are provided by a center which is a device such as e.g. an intelligent phone or a computer used by one or more authorized person, which device is capable to be connected to said external device via internet. Using said wireless communication device, said information and/or data can be delivered from said center to the lock system (1) or from said lock system (1) to said center, without necessitating any access card. Said center can be in communication with a plurality of lock systems (1) over such external device. In other words, the lock system (1) in this embodiment comprises a wireless communication device which, in use, over an external device in wireless communication with said wireless communication device, control any of said parts of the lock system (1) (i.e. the driving means, input panel (3), indicator panel (4), display (5)), and the behavior of the lock system (1) with centralized commands, and further, it can send and/or receive information/data to/from the lock system (1).

[0031] The indicator panel (4) and input panel (3) are located on sides of the lock system (1) facing opposite directions with regard to each other, such that when installed on a door wing, the input panel (3) remains one a side, and the indicator panel (4) remains on an opposite side of said door wing.

[0032] Thus a lock system (1) is provided, wherein:

- the abovementioned shortcomings of the prior art are overcome,
- it is possible to install a lock, an input panel (3) and an indicator panel (4) into a single slot on a door wing, with minimized installation and production costs,
- said lock system has enhanced user interface abilities,
- said lock system provides useful and enhanced communication with up-to-date centralized information, to a user,
- said lock system is comfortable and practical to use, without requiring a user to personally be in proximity of said lock system (1) for utilizing it.

Claims

1. A smart and compact electrical lock system (1) comprising

- a PCB card having a microprocessor, a memory and a real time clock circuit,
- a lock having a latch and an electrical or electromagnetic driving means for driving said latch, and
- a reader (2) for association with a digital access card having a memory, such that, in use, said reader (2) reads data on the memory of said access card and grants access based on validity of said data;

and said reader (2) is in electric connection with said driving means for actuating it,
said lock system (1) further comprises an input panel (3) for entering user input, and an indicator panel (4) in electrical connection with said input panel (3) for indicating said user input;
characterized in that

said lock system further comprises an alphanumerical and/or graphical display (5), and
said lock, input panel (3) and indicator panel (4) are combined in a single integrated structure.

2. A lock system (1) according to the Claim 1, wherein said indicator panel (4) is an alphanumerical or graphical display.

3. A lock system (1) according to any of the previous claims, wherein, in use, said indicator panel (4) displays information and/or a message digitally loaded on said access card.

4. A lock system (1) according to any of the previous claims, wherein said lock system (1) is battery powered.

5. A lock system (1) according to the Claim 5, wherein, in use, said indicator panel (4) displays the status of said battery.

6. A lock system (1) according to any of the previous claims, wherein said lock system further comprises a motion and/or proximity sensor.

7. A lock system (1) according to any of the previous claims, wherein said lock system further comprising a cylinder lock for manually driving said latch.

8. A lock system (1) according to any of the previous claims, wherein said lock system comprises a speaker for playing sound signals, voice records and/or text-to-speech messages.

9. A lock system (1) according to the Claim 1, wherein said input panel (3) comprises embossment(s) for use by visually challenged people.

10. A lock system (1) according to the Claim 1, wherein said lock system is associated with an external communication unit which is, in use, in communication with said electrical or electromagnetic driving means and/or input panel (3).

11. A lock system (1) according to the Claim 11, wherein said external communication unit is a remote control or a near field communication unit.

12. A lock system (1) according to any of the previous claims, further comprising a wireless communication device which, in use, delivers centralized commands to said lock system through an external device which is in wireless connection with said lock system.

13. A lock system according to any of the previous claims, wherein said indicator panel (4) and input panel (3) are located on sides of the lock system (1) facing opposite directions with regard to each other, such that when installed on a door wing, the input panel (3) remains one a side, and the indicator panel (4) remains on an opposite side of said door wing.

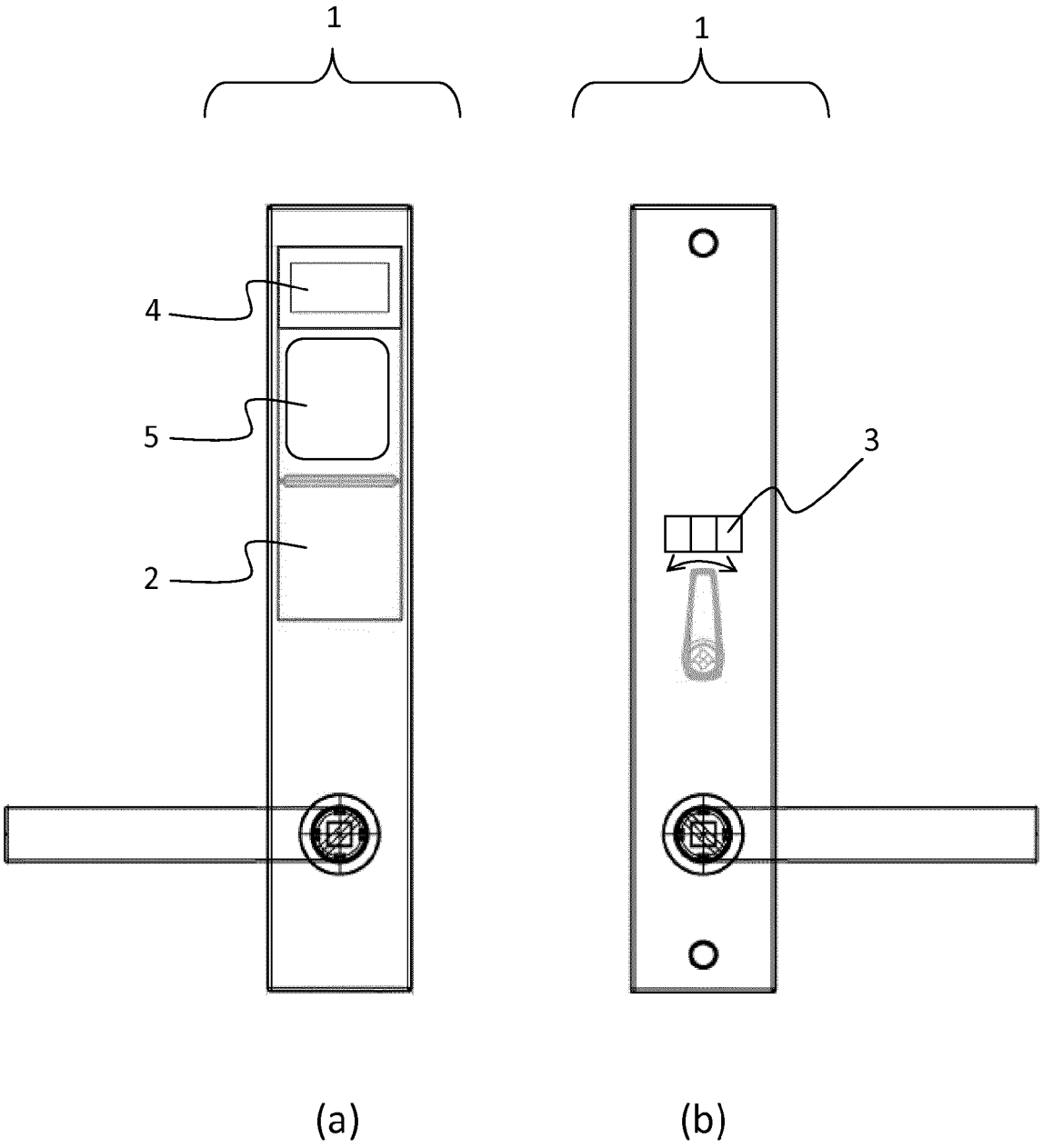

FIGURE 1

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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 5422

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	GB 2 201 728 A (GENEST LEONARD JOSEPH) 7 September 1988 (1988-09-07) * abstract * * page 5, line 15 - page 6, line 23 * * page 7, line 26 - page 10, line 26 * * page 11, line 26 - page 12, line 20 * * figures 3-6 *	1-13	INV. G07C9/00 E05B47/00 E05B65/00 E05B41/00
X	US 2007/033415 A1 (YUMOTO MANABU [JP] ET AL) 8 February 2007 (2007-02-08) * paragraph [0041] - paragraph [0044] * * paragraph [0048] - paragraph [0055] * * paragraph [0082] - paragraph [0084] * * figures 2,3,6 *	1-13	
X	US 5 850 753 A (VARMA SHIVENDRA [CA]) 22 December 1998 (1998-12-22) * column 1, line 62 - column 2, line 33 * * column 4, line 39 - column 10, line 4 * * column 12, line 16 - line 52 * * figures 1,2 *	1-13	TECHNICAL FIELDS SEARCHED (IPC)
X	WO 00/77330 A1 (BEST ON LINE SECURITY SYSTEMS [US]; WENKMAN GREGORY J [US]; WENKMAN WI) 21 December 2000 (2000-12-21) * page 7, line 10 - line 14 * * page 10, line 30 - page 13, line 28 * * figures 1,2,7,8,11,12 *	1-13	G07C E05B
A	CA 2 249 802 A1 (DEKEL LAB INC [CA]) 6 April 2000 (2000-04-06) * page 5, line 9 - line 16 * * page 7, line 23 - page 8, line 20 * * figures 1,2,11 *	1,2,4,5,7	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 December 2014	Van der Haegen, D

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 5422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2014/079544 A1 (MANZ ANDREAS [DE]; STEINHÄUSER CHRISTINE [DE]) 30 May 2014 (2014-05-30) * page 3, line 20 - page 4, line 7 *	3	
A	WO 2013/179079 A1 (FREESCALE SEMICONDUCTOR INC [US]; ARIF ENIS-NURI [RO]; OGER CHRISTOPHE) 5 December 2013 (2013-12-05) * page 7, line 1 - line 15 *	9	
A	US 6 236 303 B1 (WAGNER JOERG CORNELIUS [CA] ET AL) 22 May 2001 (2001-05-22) * abstract * * column 2, line 14 - line 64 *	2,10-13	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 December 2014	Van der Haegen, D

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02-12-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2201728 A	07-09-1988	AU 575645 B2	04-08-1988
		AU 4227885 A	05-12-1985
		BE 902527 A1	29-11-1985
		CA 1254760 A1	30-05-1989
		DE 3519059 A1	05-12-1985
		FR 2565283 A1	06-12-1985
		GB 2159568 A	04-12-1985
		GB 2201728 A	07-09-1988
		US 4616491 A	14-10-1986
US 2007033415 A1	08-02-2007	JP 2007040021 A	15-02-2007
		US 2007033415 A1	08-02-2007
US 5850753 A	22-12-1998	CA 2179819 A1	29-06-1995
		DE 69412139 D1	03-09-1998
		DE 69412139 T2	25-03-1999
		EP 0736126 A1	09-10-1996
		US 5850753 A	22-12-1998
		WO 9517570 A1	29-06-1995
WO 0077330 A1	21-12-2000	AU 5331500 A	02-01-2001
		WO 0077330 A1	21-12-2000
CA 2249802 A1	06-04-2000	NONE	
WO 2014079544 A1	30-05-2014	DE 102012022761 A1	22-05-2014
		WO 2014079544 A1	30-05-2014
WO 2013179079 A1	05-12-2013	NONE	
US 6236303 B1	22-05-2001	CA 2311616 A1	14-12-2000
		US 6236303 B1	22-05-2001
		US 2002053969 A1	09-05-2002

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