FORM 2

THE PATENT ACT 1970

(39 of 1970)

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THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(See Section 10, and rule 13)

TITLE OF THE INVENTION

AUTOMATED ELECTRIC RAMP

APPLICANT(S)

NAME:

NATIONALITY: INDIAN

ADDRESS:

The following specification particularly describes the invention and the manner in which it is to be performed

BACKGROUND

[001] Field

[002] Embodiments of the present invention generally relate to a system and a method for operating a ramp, and particularly to a system and a method for operating an automated electric ramp.

[003] Description of Related Art

[004] An entry of a building such as, a house can have three or four steps leading to a front door. For easy in and out movement of people and their vehicles, permanent ramps are constructed along with these steps. However, the permanent ramps are constructed from heavy duty construction material like cement, bricks, gravel, etc., which is expensive and require a lot of man power. Moreover, such permanent ramps cover a lot of space even when not in use, which is not desirable in a situation where an available space in front of the house is less.

[005] Conventionally, portable ramps are used, which needs to be installed at an entry of the building and can be removed after every use. Such ramps are hard to maintain and are tedious to install and remove after every use. Moreover, a slope of the ramps and a degree of incline of the ramps, play an important role in design and usefulness of the ramps. In addition, if the degree of incline of the ramps is not selected efficiently then climbing up on the ramp may require more energy to that puts anyone who uses the ramps at a risk of injury.

[006] There is thus a need for an automated ramp system allowing a safe way to move in and out of a building in an effective and efficient manner.

SUMMARY

[007] Embodiments in accordance with the present invention provide an automated ramp system. The system comprising: an electric ramp to be

installed at an entry of a house, the electric ramp comprising: a declined platform attached to an elevated surface; sensors connected to a bottom surface of the declined platform configured to sense signals representing a contact of the declined platform with a ground surface; and a control unit connected to the sensors and hydraulic jacks attached to the bottom surface of the declined platform. The control unit is configured to: receive input signals from a user using a panel, wherein the input signals are one of, an upward movement signal, or a downward movement signal; activate the hydraulic jacks using relays based on the received input signals; receive sensed signals representing the contact of the declined platform with the ground surface from the sensors; and deactivate the hydraulic jacks using the relays when the contact of the declined platform with the ground surface is detected based on the received sensed signals.

[008] Embodiments in accordance with the present invention provide further provide a method for operating an electric ramp, the method comprising steps of: receiving input signals from a user using a panel, wherein the input signals is one of, an upward movement signal, or a downward movement signal; activating hydraulic jacks connected to a bottom surface of a declined platform using relays based on the received input signals; receiving sensed signals representing a contact of the declined platform with a ground surface from sensors connected to the bottom surface of the declined platform; and deactivating the hydraulic jacks using the relays when the contact of the declined platform with the ground surface is detected based on the received sensed signals.

[009] Embodiments in accordance with the present invention provide an automated ramp system that may assist family members and vehicles in/out of houses.

[0010] These and other advantages will be apparent from the present application of the embodiments described herein.

[0011] The preceding is a simplified summary to provide an understanding of some embodiments of the present invention. This summary is neither an extensive nor exhaustive overview of the present invention and its various embodiments. The summary presents selected concepts of the embodiments of the present invention in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other embodiments of the present invention are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The above and still further features and advantages of embodiments of the present invention will become apparent upon consideration of the following detailed description of embodiments thereof, especially when taken in conjunction with the accompanying drawings, and wherein:

[0013] FIG. 1A illustrates a block diagram of an automated ramp system, according to an embodiment of the invention disclosed herein;

[0014] FIG. 1B illustrates a left view of an electric ramp of the automated ramp system, according to an embodiment of the present invention disclosed herein;

[0015] FIG. 1C illustrates a right perspective view of the electric ramp, according to an embodiment of the present invention disclosed herein;

[0016] FIG. 1D illustrates a left perspective view of the electric ramp, according to an embodiment of the present invention disclosed herein;

[0017] FIG. 1E illustrates a circuit block diagram of the electric ramp, according to an embodiment of the present invention disclosed herein;

[0018] FIG. 1F illustrates a circuit block diagram of the electric ramp, according to another embodiment of the present invention disclosed herein;

[0019] FIG. 2 illustrates components of a control unit of the electric ramp, according to embodiments of the present invention disclosed herein; and

[0020] FIG. 3 illustrates a flowchart of a method for operating the electric ramp, according to an embodiment of the present invention disclosed herein.

[0021] The headings used herein are for organizational purposes only and are not meant to be used to limit the scope of the description or the claims. As used throughout this application, the word "may" is used in a permissive sense (*i.e.*, meaning having the potential to), rather than the mandatory sense (*i.e.*, meaning must). Similarly, the words “include”, “including”, and “includes” mean including but not limited to. To facilitate understanding, like reference numerals have been used, where possible, to designate like elements common to the figures. Optional portions of the figures may be illustrated using dashed or dotted lines, unless the context of usage indicates otherwise.

DETAILED DESCRIPTION

[0022] The following description includes the preferred best mode of one embodiment of the present invention. It will be clear from this description of the invention that the invention is not limited to these illustrated embodiments but that the invention also includes a variety of modifications and embodiments thereto. Therefore, the present description should be seen as illustrative and not limiting. While the invention is susceptible to various modifications and alternative constructions, it should be understood, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all

modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention as defined in the claims.

[0023] In any embodiment described herein, the open-ended terms "comprising," "comprises," and the like (which are synonymous with "including," "having" and "characterized by") may be replaced by the respective partially closed phrases "consisting essentially of," consists essentially of," and the like or the respective closed phrases "consisting of," "consists of, the like.

[0024] As used herein, the singular forms “a”, “an”, and “the” designate both the singular and the plural, unless expressly stated to designate the singular only.

[0025] FIG. 1A illustrates a block diagram of an automated ramp system 100, according to an embodiment of the invention. The automated ramp system 100 comprises an electric ramp 102, and a user device 104. Further, the electric ramp 102 and the user device 104 may be connected through a communication network 106, according to embodiments of the present invention.

[0026] The communication network 106 may include a data network such as, but not limited to, an Internet, a Local Area Network (LAN), a Wide Area Network (WAN), a Metropolitan Area Network (MAN), and so forth. In some embodiments of the present invention, the communication network 106 may include a wireless network, such as, but not limited to, a cellular network and may employ various technologies including an Enhanced Data Rates for Global Evolution (EDGE), a General Packet Radio Service (GPRS), and so forth. In some embodiments of the present invention, the communication network 106 may include or otherwise cover networks or sub-networks, each of which may include, for example, a wired or a wireless data pathway. According to an embodiment of the present invention, the electric ramp 102, and the user device 106 may be

configured to communicate with each other by one or more communication mediums connected to the communication network 106. The communication mediums include, but are not limited to, a coaxial cable, a copper wire, a fiber optic, a wire that comprise a system bus coupled to a processor of a computing device, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the communication mediums, including known, related art, and/or later developed technologies.

[0027] According to embodiments of the present invention, the electric ramp 102 may be an electrically operated device installed at an entry of a building such as, but not limited to, a house, a workshop, a vehicle service center, and so forth. The electric ramp 102 may be configured to enable an ascend and/or a descend of a user and/or a vehicle between an elevated surface 136 (as shown in FIG. 1B) and a ground surface. Further, the elevated surface 136 may be supported on the ground surface through pillars 138a-138d (hereinafter referred to the pillars 138). In an embodiment of the present invention, the electric ramp 102 may comprise two platforms hinged together to form the electric ramp 102. According to embodiments of the present invention, the electric ramp 102 may be a battery-operated electric ramp. According to embodiments of the present invention, the electric ramp 102 may be made up of a material, such as, but not limited to, an iron, an aluminum, a wood, a hardened plastic, an anti-slip rubber, a chromed steel, a stainless steel, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the material for the electric ramp 102 including known, related art, and/or later developed technologies.

[0028] The user device 104 may be configured to enable the user to receive data and transmit data within the automated ramp system 100. In an embodiment of the present invention, the user device 104 may be used to control the operation of the electric ramp 102. The user may be, but not

limited to, an operator, a mechanic, a worker, a family member, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the user of the automated ramp system 100. According to embodiments of the present invention, the user device 104 may be, but not limited to, a mobile device, a smart phone, a tablet computer, a portable computer, a laptop computer, a desktop computer, a smart device, a smart watch, a smart glass, and so forth. Embodiments are intended to include or otherwise cover any type of the user device 104, including known, related art, and/or later developed technologies.

[0029] Further, the user device 104 may comprise a user interface 108, and a processor 110. The user interface 108 may be configured to enable the user to input data into the automated ramp system 100, according to an embodiment of the present invention. According to an embodiment of the present invention, the user device 104 may enable the user to receive data within the automated ramp system 100. The user interface 108 may be further configured to display output data associated with the automated ramp system 100, in an embodiment of the present invention. Further, the user interface 108 may be, but is not limited to, a digital display, a touch screen display, a graphical user interface, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the user interface 108 including known, related art, and/or later developed technologies that may be capable of enabling the user to input data and to display an output data.

[0030] The processor 110 may be configured to receive data associated with the automated ramp system 100 using the communication network 106. Further, the processor 110 may be configured to receive, transmit and process data associated with the automated ramp system 100, in an embodiment of the present invention. According to embodiments of the present invention, the processor 110 may be, but not limited to, a Programmable Logic Control unit (PLC), a microcontroller, a

microprocessor, a computing device, a development board, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the processor 110 including known, related art, and/or later developed technologies that may be capable of processing the received data. Further, the user device 104 may comprise a ramp control application 112 that may be a computer readable program configured to enable the user to operate the electric ramp 102, in an embodiment of the present invention.

[0031] FIG. 1B illustrates a left view of the electric ramp 102, according to an embodiment of the present invention. The electric ramp 102 may comprise a declined platform 114, sensors 116a-116n (hereinafter referred to as the sensors 116), hydraulic jacks 118a-118m (hereinafter referred to as the hydraulic jacks 118), a panel 120, an Internet of Things (IOT) box 122, and a control unit 124.

[0032] According to embodiments of the present invention, the declined platform 114 may be attached to the elevated surface 136 to be used by the user to ascend a vehicle from the ground surface to the elevated surface 136. Further, the declined platform 114 may be used by the user to descend the vehicle from the elevated surface 136 to the ground surface. Furthermore, the declined platform 114 may be designed to be automatically raised and/or lowered between the ground surface and the elevated surface 136, according to embodiments of the present invention. According to embodiments of the present invention, the declined platform 114 may be made up of a material, such as, but not limited to, an iron, an aluminum, a hardened plastic, a chromed steel, a wood, a stainless steel, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the material for the declined platform 114 including known, related art, and/or later developed technologies.

[0033] The sensors 116 may be installed at a bottom surface of the declined platform 114, in an embodiment of the present invention. In an embodiment of the present invention, the sensors 116 may be installed at a distal end such as, on an opposite side of the declined platform 114 from the elevated surface 136. The sensors 116 may be configured to sense signals representing a contact of the declined platform 114 with the ground surface. According to embodiments of the present invention, the sensors 116 may be, but not limited to, a contact sensor, a stopper sensor, a proximity sensor, an ultrasonic sensor, an Infrared (IR) sensor, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the sensors 116 including known, related art, and/or later developed technologies.

[0034] The hydraulic jacks 118 may be operated using a motor for lifting the declined platform 114. The hydraulic jacks 118 may use a force created by a pressure inside of a chamber of a hydraulic cylinder within the hydraulic jacks 118. Further, a distance that may be travelled by the hydraulic cylinder of the hydraulic jacks 118 from a fully closed position to a fully open position may be 450 Millimeters (mm), according to embodiments of the present invention. Furthermore, the hydraulic jacks 118 may be a single acting cylinder based power jack having a 3 ton capacity, in an embodiment of the present invention. In an embodiment of the present invention, the hydraulic jacks 118 may be attached to the bottom surface of the declined platform 114. According to embodiments of the present invention, the hydraulic jacks 118 may be, but not limited to, a single-acting flat jack, a single-acting low height jack, a single-acting load return jack, a single-acting lock nut jack, a single-acting hollow plunger jack, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the hydraulic jacks 118 including known, related art, and/or later developed technologies that may be beneficial to uplift and/or down lift the declined platform 114.

[0035] The panel 120 may be a device that may be used by the user to operate the electric ramp 102, in an embodiment of the present invention. Further, the panel 120 may be connected to relays 126a-126b (hereinafter interchangeably referred to as the relays 126) (as shown in FIG. 1E), in an embodiment of the present invention. The relays 126a-126b may be used for activating and/or deactivating the hydraulic jacks 118 based on the received input signals from the user using the panel 120, in an embodiment of the present invention. According to embodiments of the present invention, the relays 126a-126b may be, but not limited to, an electromagnetic relay, a solid-state relay, a hybrid relay, a thermal relay, a reed relay, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the relays 126a-126b including known, related art, and/or later developed technologies.

[0036] Furthermore, the panel 120 may comprise push buttons 128a-128b (hereinafter referred to as the push buttons 128). The push buttons 128 may be provided for enabling the user to provide the input signals for operating the electric ramp 102. According to embodiments of the present invention, the input signals may be, but not limited to, an upward movement signal, a downward movement signal, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the input signals, including known, related art, and/or later developed technologies. The push buttons 128 may be, but not limited to, a momentary push button, a latching push button, an electric push button, a pneumatic push button, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the push buttons 128, including known, related art, and/or later developed technologies.

[0037] The IOT box 122 may be an enclosure that may be used for housing components to control an operation of the electric ramp 102, according to embodiments of the present invention. The IOT box 122 may

be connected to relays 126c-126d (hereinafter interchangeably referred to as the relays 126) (as shown in the FIG. 1E), according to an embodiment of the present invention. The relays 126c-126d may be used for activating and/or deactivating the hydraulic jacks 118 based on the received input signals from the user using the user device 104. According to embodiments of the present invention, the relays 126c-126d may be, but not limited to, an electromagnetic relay, a solid-state relay, a hybrid relay, a thermal relay, a reed relay, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the relays 126c-126d including known, related art, and/or later developed technologies.

[0038] Further, the IOT box 122 may comprise a communication device 130, and an Integrated Circuit (IC) chip 132, according to an embodiment of the present invention. The communication device 130 may be configured to enable the user to connect the user device 104 with the IOT box 122, in an embodiment of the present invention. According to embodiments of the present invention, the communication device 130 may be, but not limited to, a Bluetooth HC-05 device, an Infrared device, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the communication device 130, including known, related art, and/or later developed technologies. According to embodiments of the present invention, the IC chip 132 may be used to control the operations of the electric ramp 102 based on the input signals received from the user through the user device 104. The IC chip 132 may be, but not limited to, a Field-Programmable Gate Array (FPGA) chip, an Application Specific Integrated Circuit (ASIC) chip, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the IC chip 132, including known, related art, and/or later developed technologies. Further, the IOT box 122 may be connected to a power supply 150 (as shown in FIG. 1F) for providing electrical current to

the components of the IOT box 122.

[0039] The control unit 124 of the electric ramp 102 may be configured to process data associated with the automated ramp system 100 to generate an output, and perform other operations related to the automated ramp system 100. According to embodiments of the present invention, the control unit 124 may be, but not limited to, a Programmable Logic Control unit (PLC), a microcontroller, a microprocessor, a computing device, a development board, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the control unit 124 including known, related art, and/or later developed technologies that may be capable of processing the received data. Further, the working of the control unit 124 will be explained in detail in conjunction with the FIG. 2.

[0040] FIG. 1C illustrates a right perspective view of the electric ramp 102, according to an embodiment of the present invention. The electric ramp 102 may be an electrically operated device installed at the entry of the building that may be configured to enable an ascend and/or a descend of a user and/or a vehicle between the elevated surface 136 and the ground surface. In an embodiment of the present invention, the electric ramp 102 may comprise platforms 134a-134b attached together to form the electric ramp 102 using a hinge mechanism. The electric ramp 102 may be attached to the elevated surface 136 using a hinge mechanism, in an embodiment of the present invention. Further, the elevated surface 136 may be supported by pillars 138a-138d (hereinafter referred to as the pillars 138), in an embodiment of the present invention. According to embodiments of the present invention, the pillars 138 may be made up of a material, such as, but not limited to, an iron, an aluminum, a hardened plastic, a chromed steel, a wood, a stainless steel, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the material for the pillars 138 including known, related art, and/or later developed technologies.

[0041] FIG. 1D illustrates a left perspective view of the electric ramp 102, according to an embodiment of the present invention. The electric ramp 102 may comprise the platforms 134a-134b attached together to form the electric ramp 102 using a hinge mechanism. The hinge mechanism may enable the user to fold the platform 134a towards the platform 134b by rotating the platform 134a towards a top surface of the platform 134b in an anti-clockwise direction, according to an embodiment of the present invention.

[0042] FIG. 1E illustrates a circuit block diagram of the electric ramp 102, according to an embodiment of the present invention. According to embodiments of the present invention, the electric ramp 102 may comprise a Switched Mode Power Supply (SMPS) 140 connected to a 220 Volts (V) Alternating Current (AC) power supply 142 for providing an input current for the operation of the components of the electric ramp 102. Further, the SMPS 140 may be connected to a Ground terminal (GND) 144. The SMPS 140 may be configured to convert the 220 V AC power supply 142 into 12 V Direct Current (DC), in an embodiment of the present invention.

[0043] Furthermore, the SMPS 140 may be configured to transmit the converted 12 V DC to the relays 126a-126b through the push buttons 128 of the panel 120, in an embodiment of the present invention. In an embodiment of the present invention, if the push buttons 128a is pressed by the user, then the corresponding relay 126a may trip and the 12 V DC may be supplied to contractors 146a-146b connected to the relay 126a. The contractors 146a-146b may be electrical switches that may be activated by the 12 V DC and enable the transmission of the 12 V DC to activate the hydraulic jacks 118. According to an embodiment of the present invention, the IOT box 122 may be connected to the relays 126c-126d for controlling the operation of the electric ramp 102. The electric ramp 102 may comprise a battery 148 that may be configured to provide an input voltage for the operations of the electric ramp 102. In an

embodiment of the present invention, the battery 148 may be configured to store the charge provided through the 12 V DC that may be used for operating the electric ramp 102.

[0044] FIG. 1F illustrates a circuit block diagram of the electric ramp 102, according to another embodiment of the present invention. The IOT box 122 may be connected to the relays 126c-126d for controlling the operation of the electric ramp 102. The IOT box 122 may be connected to the power supply 150 that may provide an input voltage for the operation of the components of the IOT box 122. In an embodiment of the present invention, the input voltage may activate the communication device 130 such that the communication device 130 enables the user to connect the user device 104 to the IOT box 122. The user device 104 may comprise the ramp control application 112 that may be configured to enable the user to operate the electric ramp 102, according to an embodiment of the present invention. The ramp control application 112 may be configured to display a control panel using the user interface 108 of the user device 104. Further, the control panel may enable the user to provide input signals that may be transmitted to the IC chip 132. Furthermore, the IC chip 132 may be configured to transmit the input signals to the control unit 124 of the electric ramp 102 for controlling the operation of the electric ramp 102, according to embodiments of the present invention.

[0045] FIG. 2 illustrates components of the control unit 124 of the electric ramp 102, according to embodiments of the present invention. The control unit 124 comprises an input module 200, a jack activation module 202, a sensor configuration module 204, a data collection module 206, a data processing module 208, a jack deactivation module 210, and a communication module 212, according to an embodiment of the present invention.

[0046] The input module 200 may be configured to enable a user to

generate input signals by using the push buttons 128 disposed on the panel 120. According to embodiments of the present invention, the input signals may be, but not limited to, an upward movement signal, a downward movement signal, an upward movement stop signal, a downward movement stop signal, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the input signals, including known, related art, and/or later developed technologies. According to embodiments of the present invention, if the user presses the push button 128a, then the input module 200 may be configured to generate the upward movement signal. Further, if the user presses the push button 128b, then the input module 200 may be configured to generate the downward movement signal.

[0047] According to another embodiment of the present invention, the input module 200 may be further configured to enable the user to generate the input signals by using the control panel displayed through the user interface 108 of the user device 104. In an embodiment of the present invention, the control panel displayed on the user interface 108 of the user device 104 may comprise a button A, a button B, a button I, and a button D. In another embodiment of the present invention, a button of a keypad of the user device 104 marked as ”A” may be used as the button A. Further, a button of the keypad of the user device 104 marked as ”B” may be used as the button B. Further, a button of the keypad of the user device 104 marked as ”I” may be used as the button I. Further, a button of the keypad of the user device 104 marked as ”D” may be used as the button D.

[0048] According to embodiments of the present invention, if the user presses the button A, then the input module 200 may be configured to generate the upward movement signal. Further, if the user presses the button B then the input module 200 may be configured to generate the upward movement stop signal. Further, if the user presses the button I

then the input module 200 may be configured to generate the downward movement signal. Further, if the user presses the button D then the input module 200 may be configured to generate the downward movement stop signal. According to embodiments of the present invention, the input module 200 may be configured to transmit the generated upward movement signal and the generated downward movement signal to the jack activation module 202 and the sensor configuration module 204. Furthermore, the input module 200 may be configured to transmit the generated upward movement stop signal and the generated downward movement stop signal to the jack deactivation module 210, according to an embodiment of the present invention.

[0049] The jack activation module 202 may be configured to activate the hydraulic jacks 118 connected to the bottom surface of the declined platform 114 based on the received input signals. According to an embodiment of the present invention, the jack activation module 202 may be configured to transmit the generated upward movement signal to the relay 126a using the communication module 212. The upward movement signal may activate the relays 126 that may further activate the hydraulic jacks 118 for lifting the declined platform 114 in an upward direction. Further, the jack activation module 202 may be configured to transmit the generated downward movement signal to the relays 126 using the communication module 212, in an embodiment of the present invention. The downward movement signal may activate the relays 126 that may further activate the hydraulic jacks 118 for descending the declined platform 114 in a downward direction.

[0050] According to embodiments of the present invention, the received downward movement signal may enable the sensor configuration module 204 that may be further configured to activate the sensors 116 of the electric ramp 102. The sensor configuration module 204 may be configured to enable the sensors 116 to sense signals representing a

contact of the declined platform 114 with a ground surface. The sensors 116 may be installed at a bottom surface of the declined platform 114, in an embodiment of the present invention. According to embodiments of the present invention, the sensors 116 may be, but not limited to, a contact sensor, a stopper sensor, a proximity sensor, an ultrasonic sensor, and so forth. Embodiments of the present invention are intended to include or otherwise cover any type of the sensors 116 including known, related art, and/or later developed technologies. Further, the sensor configuration module 204 may be configured to transmit the received sensed signals from the sensors 116 to the data collection module 206, in an embodiment of the present invention.

[0051] According to embodiments of the present invention, the data collection module 206 may be configured, to receive the sensed signals from the sensor configuration module 204. Further, the data collection module 206 may be configured to store the received sensed signals onto a memory (not shown) of the electric ramp 102. According to an embodiment of the present invention, the data collection module 206 may be further configured to transmit the received sensed signals to the data processing module 208.

[0052] The data processing module 208 may be configured to process the received sensed signals from the sensors 116 to detect the contact of the declined platform 114 with the ground surface. The data processing module 208 may be configured to determine a distance between the declined platform 114 and the ground surface at a predefined time interval. According to embodiments of the present invention, the predefined time intervals may be 2 seconds. In an exemplary scenario, if the data processing module 208 determines that the contact of the declined platform 114 with the ground surface is detected based on the received sensed signals then the data processing module 208 may be configured to generate the downward movement stop signal. In another exemplary

scenario, if the data processing module 208 determines that the contact of the declined platform 114 with the ground surface is not detected based on the received sensed signals then the data processing module 208 may be configured to enable the sensor configuration module 204 to continue receiving sensed signals from the sensors 116. Further, the data processing module 208 may be configured to transmit the generated downward movement stop signal to the jack deactivation module 210, in an embodiment of the preset invention.

[0053] The jack deactivation module 210 may be configured to deactivate the hydraulic jacks 118 based on the received downward movement stop signal, according to the embodiment of the present invention. Further, the jack deactivation module 210 may be configured to transmit the generated downward movement stop signal to the relays 126 using the communication module 212, in an embodiment of the present invention. The downward movement stop signal may deactivate the relays 126 that may further deactivate the hydraulic jacks 118, according to an embodiment of the present invention.

[0054] FIG. 3 illustrates a flowchart of a method for operating the electric ramp 102, according to an embodiment of the present invention.

[0055] At step 302, the automated ramp system 100 may receive input signals from the user of the electric ramp 102 through the user device 104, in an embodiment of the present invention. The input signals may include, but not limited to, an upward movement signal, a downward movement signal, an upward movement stop signal, a downward movement stop signal, and so forth.

[0056] At step 304, the automated ramp system 100 may activate the hydraulic jacks 118 of the electric ramp 102 through the relays 126 based on the received input signals.

[0057] At step 306, the automated ramp system 100 may activate the sensors 116 installed at the bottom surface of the electric ramp 102.

[0058] At step 308, the automated ramp system 100 may receive sensed signals representing the contact of the declined platform 114 with the ground surface from the sensors 116.

[0059] At step 310, if the automated ramp system 100 determines that the contact with the ground surface is detected, then the process 300 may proceed to a step 312, otherwise the process 300 may return to the step 308.

[0060] At step 312, the automated ramp system 100 may deactivate the hydraulic jacks 118 through the relays 126 when the contact of the declined platform 114 with the ground surface is detected based on the received sensed signals.

[0061] Embodiments of the invention are described above with reference to block diagrams and schematic illustrations of methods and systems according to embodiments of the invention. It will be understood that each block of the diagrams and combinations of blocks in the diagrams can be implemented by computer program instructions. These computer program instructions may be loaded onto one or more general purpose computers, special purpose computers, or other programmable data processing apparatus to produce machines, such that the instructions which execute on the computers or other programmable data processing apparatus create means for implementing the functions specified in the block or blocks. Such computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means that implement the function specified in the block or blocks.

[0062] While the invention has been described in connection with what is presently considered to be the most practical and various embodiments, it is to be understood that the invention is not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

[0063] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope the invention is defined in the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements within substantial differences from the literal languages of the claims.

CLAIMS

I/We Claim:

1. An automated ramp system (100), the system (100) comprising:

an electric ramp (102) to be installed at an entry of a house, the electric ramp (102) comprising:

a declined platform (114) attached to an elevated surface (136);

sensors (116a-116n) connected to a bottom surface of the declined platform (114) configured to sense signals representing a contact of the declined platform (114) with a ground surface; and

a control unit (124) connected to the sensors (116a-116n) and hydraulic jacks (118a-118m) attached to the bottom surface of the declined platform (114), wherein the control unit (124) is configured to:

receive input signals from a user using a panel (120), wherein the input signals are one of, an upward movement signal, or a downward movement signal;

activate the hydraulic jacks (118a-118m) using relays (126a-126d) based on the received input signals;

receive sensed signals representing the contact of the declined platform (114) with the ground surface from the sensors (116a-116n); and

deactivate the hydraulic jacks (118a-118m) using the relays (126a-126d) when the contact of the declined platform (114) with the ground surface is detected based on the received sensed signals.

2. The system as claimed in claim 1, wherein the panel (120) comprises push buttons (128a-128b) for enabling the user to provide the input signals.

3. The system as claimed in claim 1, wherein the control unit (124) is configured to receive the input signals from the user using a user device (104), wherein the input signals comprise one of, the upward movement signal, the downward movement signal, an upward movement stop signal, a downward movement stop signal, or a combination thereof.

4. The system as claimed in claim 3, wherein the control unit (124) is configured to activate the hydraulic jacks (118a-118m) using the relays (126a-126d) based on the received upward movement signal and the received downward movement signal to enable a movement of the declined platform (114) in one of, an upward direction, or a downward direction.

5. The system as claimed in claim 3, wherein the control unit (124) is configured to deactivate the hydraulic jacks (118a-118m) using the relays (126a-126d) based on the received upward movement stop signal, or the downward movement stop signal.

6. A method for operating an electric ramp (102), the method comprising steps of:

receiving input signals from a user using a panel (120), wherein the input signals is one of, an upward movement signal, or a downward movement signal;

activating hydraulic jacks (118a-118m) connected to a bottom surface of a declined platform (114) using relays (126a-126d) based on the received input signals;

receiving sensed signals representing a contact of the declined platform (114) with a ground surface from sensors (116a-116n) connected to the bottom surface of the declined platform (114); and

deactivating the hydraulic jacks (118a-118m) using the relays (126a-126d) when the contact of the declined platform (114) with the ground surface is detected based on the received sensed signals.

7. The method as claimed in claim 6, comprising a step of enabling the user to provide input signals using push buttons (128a-128b) of the panel (120).

8. The method as claimed in claim 6, comprising a step of receiving input signals from the user using a user device (104), wherein the input signals comprise one of, the upward movement signal, the downward movement signal, an upward movement stop signal, a downward movement stop signal, or a combination thereof.

9. The method as claimed in claim 8, comprising a step of activating the hydraulic jacks (118a-118m) using the relays (126a-126d) based on the received upward movement signal and the received downward movement signal to enable a movement of the declined platform in one of, an upward direction, or a downward direction.

10. The method as claimed in claim 8, comprising a step of deactivating the hydraulic jacks (118a-118m) using the relays (126a-126d) based on one of the received upward movement stop signal, or the downward movement stop signal.

Date:

Place: Noida

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Agent for the Applicant
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Title: AUTOMATED ELECTRIC RAMP

ABSTRACT

An automated ramp system (100) comprising: an electric ramp (102) comprising: a declined platform (114) attached to an elevated surface (136); sensors (116a-116n) connected to a bottom surface of the declined platform (114) configured to sense signals representing a contact of the declined platform (114) with a ground surface; and a control unit (124) configured to: receive input signals from a user using a panel (120), wherein the input signals are, an upward movement signal, or a downward movement signal; activate the hydraulic jacks (118a-118m) using relays (126a-126d) based on the received input signals; receive sensed signals representing the contact of the declined platform (114) with the ground surface from the sensors (116a-116n); and deactivate the hydraulic jacks (118a-118m) using the relays (126a-126d) when the contact of the declined platform (114) with the ground surface is detected based on the received sensed signals.

Claims: 10, Figures: 8

Figure 1B is selected.

DRAWINGS

Name of the Applicant:

Application No.: **Total Sheets:** 5
No. of sheet: 1 of 5

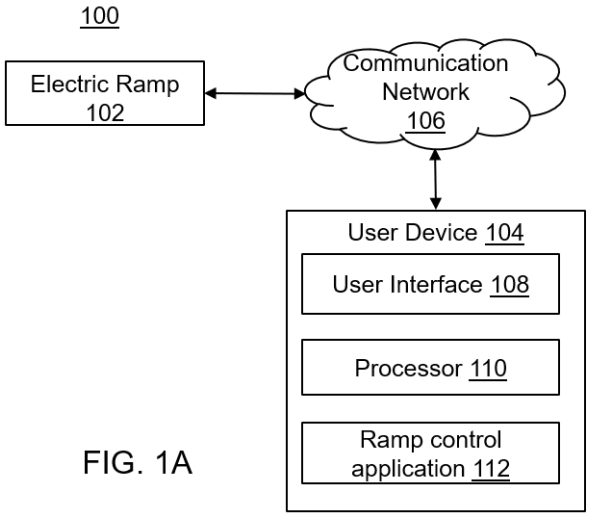

FIG. 1A

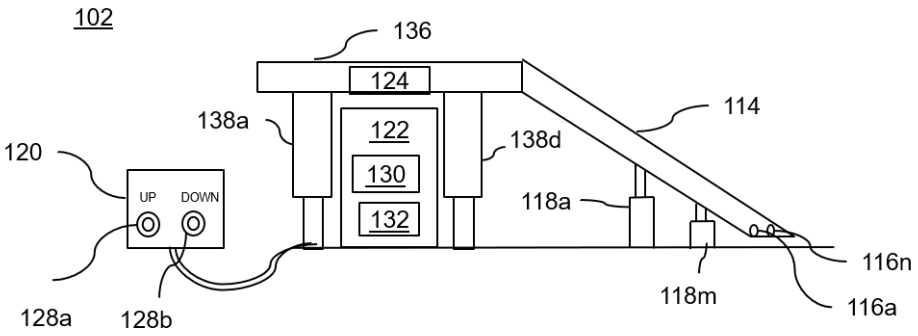

FIG. 1B

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DRAWINGS

Name of the Applicant:

Application No.: **Total Sheets:** 5
No. of sheet: 2 of 5

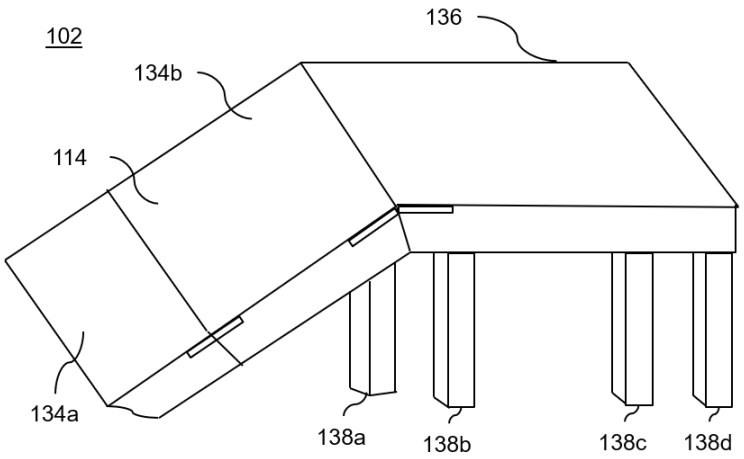

FIG.1C

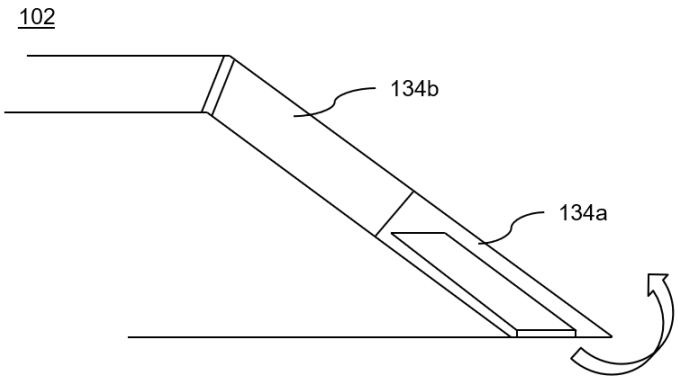

FIG. 1D

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DRAWINGS

Name of the Applicant:

Application No.:

Total Sheets: 5
No. of sheet: 3 of 5

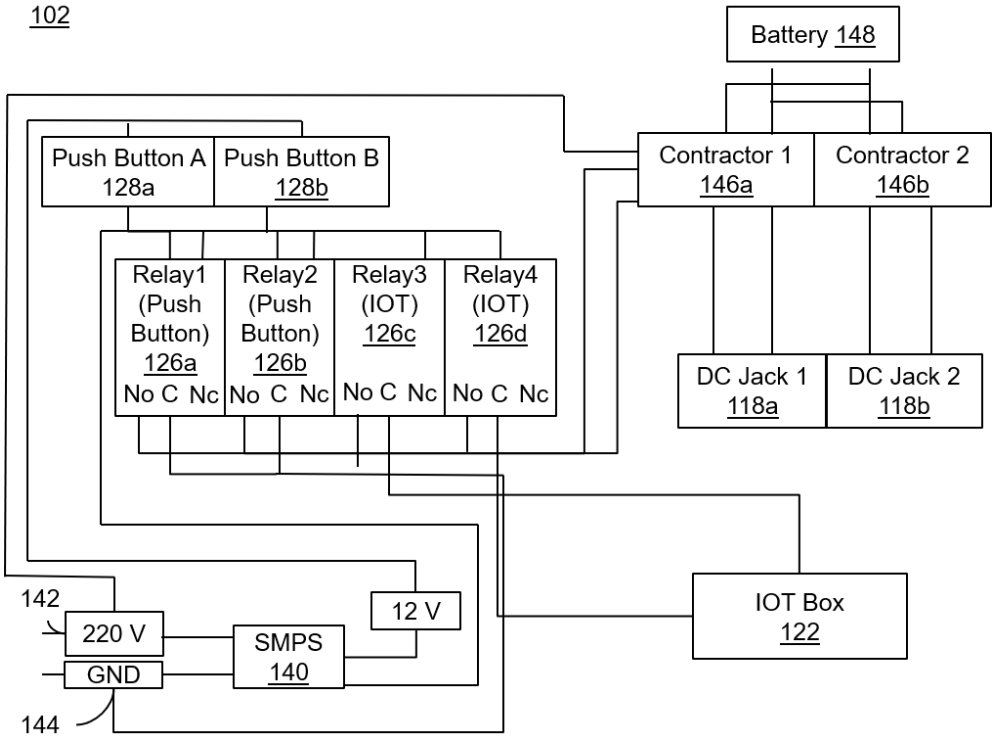

FIG. 1E

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DRAWINGS

Name of the Applicant:

Application No.:

Total Sheets: 5
No. of sheet: 4 of 5

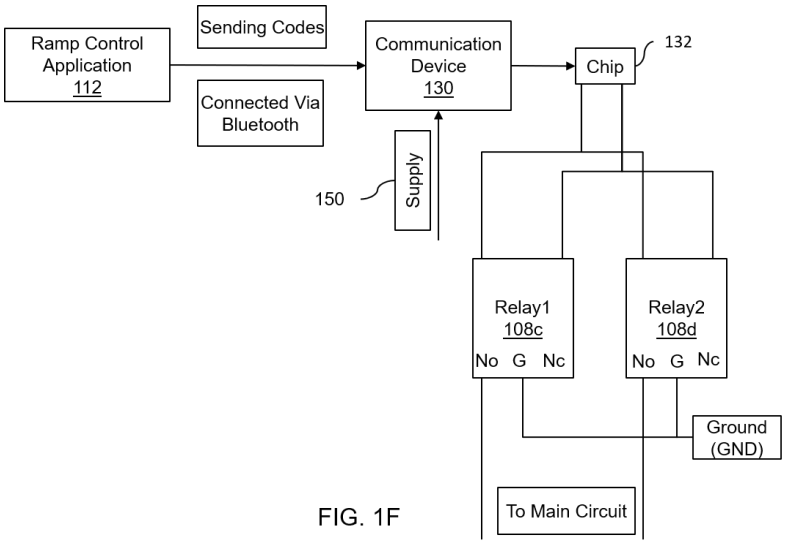

FIG. 1F

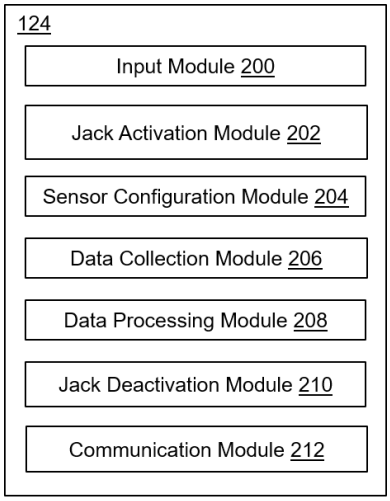

FIG. 2

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DRAWINGS

Name of the Applicant:

Application No.:

Total Sheets: 5
No. of sheet: 5 of 5

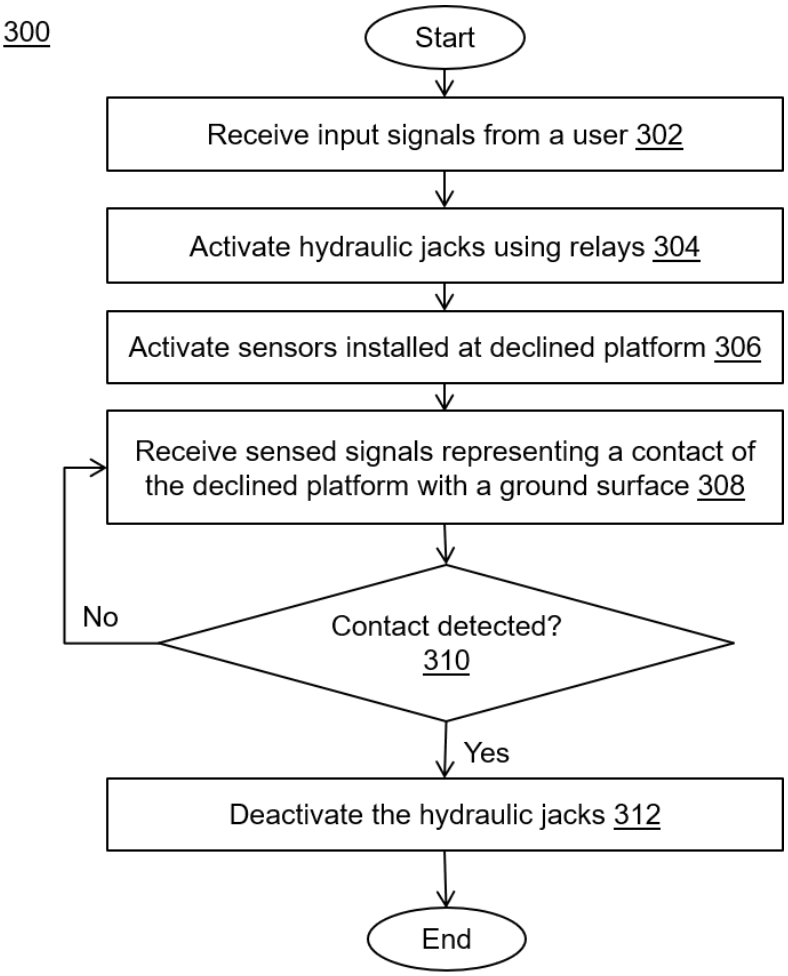

FIG. 3

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