United States Patent Application Publication	20250262881
Kind Code	A1
Publication Date	August 21, 2025
Inventor(s)	SUTO; TAKAYA

IMAGE PRINTING APPARATUS AND METHOD OF CONTROLLING THE SAME

Abstract

An image printing apparatus having a recording head that ejects a liquid toward a recording medium, a control circuit board that includes a control IC configured to control the image printing apparatus and a power control circuit board that includes a power control IC configured to control power supplied to the control circuit board. The power control IC is capable of entering a first state in which the power control IC outputs power to the control circuit board and a second state in which the power control IC does not output power to the control circuit board, and the power control IC detects a transition signal that causes transition between the first state and the second state.

Inventors:	**SUTO; TAKAYA (Kanagawa, JP)**
Applicant:	**CANON KABUSHIKI KAISHA** (Tokyo, JP)
Family ID:	**1000008477495**
Appl. No.:	**19/056181**
Filed:	**February 18, 2025**

Foreign Application Priority Data

JP	2024-023036	Feb. 19, 2024

Publication Classification

Int. Cl.:   **B41J29/393** (20060101); **H02J1/00** (20060101)

U.S. Cl.:

CPC   **B41J29/393** (20130101); **H02J1/00** (20130101);

Background/Summary

BACKGROUND
Field
[0001] The present application relates to an image printing apparatus and a method of controlling the image printing apparatus.
Description of the Related Art
[0002] An electronic device such as a printer typically has an OFF state in which the electronic device is on standby waiting for a key operation to be made on a power key and an ON state in which the electronic device can perform desired normal operations. In the ON state, necessary power is supplied to each unit of the electronic device so that the electronic device can operate appropriately. On the other hand, in the OFF state, the electronic device is required to operate in a minimum power consumption state by saving power as much as possible.
[0003] Japanese Patent Laid-Open No. 2021-118666 describes a control circuit that includes: a power supply circuit configured to output DC power by receiving power supplied from a switching power supply; and a mode control circuit that operates with power supplied from a sub power supply. The control circuit performs mode switching control of the switching power supply with use of the mode control circuit and realizes power saving control by transmitting a disabling signal to the power supply circuit if the voltage does not become equal or lower than a set voltage even after mode switching.
[0004] However, in the conventional technology described above, the mode control circuit controls the power supply circuit, and accordingly, it is necessary to continue to always supply power from the sub power supply to the mode control circuit to detect pressing on a power key while an apparatus main body is in an OFF state. Therefore, even when the switching power supply is turned off, power is consumed by the sub power supply, and it is desired to further suppress power consumption.
SUMMARY
[0005] Embodiments of the present disclosure eliminate the above-mentioned issues with conventional technology.
[0006] The present disclosure provides advantageous techniques for performing power saving control by suppressing power consumption.
[0007] According to some embodiments of the present disclosure, an image printing apparatus includes a recording head configured to eject a liquid toward a recording medium; a control circuit board that includes a control integrated circuit (IC) configured to control the image printing apparatus; and a power control circuit board that includes a power control IC configured to control power supplied to the control circuit board, wherein the power control IC is capable of entering a first state in which the power control IC outputs power to the control circuit board and a second state in which the power control IC does not output power to the control circuit board, and the power control IC detects a transition signal that causes transition between the first state and the second state.
[0008] According to some embodiments of the present disclosure, a method of controlling an image printing apparatus includes a recording head configured to eject a liquid toward a recording medium; a control circuit board including a control IC configured to control the image printing apparatus; and a power control circuit board including a power control IC configured to control power supplied to the control circuit board, wherein the power control IC is capable of entering a first state in which the power control IC outputs power to the control circuit board and a second state in which the power control IC does not output power to the control circuit board, the method comprising: detecting a transition signal that causes transition between the first state and the second

state; and controlling power supply to the control circuit board in accordance with a detection state of the transition signal.

[0009] Further features of the present disclosure will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the disclosure and, together with the description, serve to explain the principles of the disclosure.

[0011] FIG. **1** depicts a perspective view of the external appearance of a printing apparatus according to some embodiments.

[0012] FIG. **2** is a block diagram for describing a schematic configuration of a power control IC according to some embodiments.

[0013] FIG. **3** is a block diagram for describing configurations of a main controller and the power control IC in the printing apparatus according to some embodiments.

[0014] FIG. **4** is a flowchart for describing an example of transition of the state of the printing apparatus according to the embodiment when external power is supplied to the printing apparatus.

[0015] FIG. **5** is a flowchart for describing processing performed when the printing apparatus according to the embodiment transitions from an operable state to a standby state.

[0016] FIG. **6** is a sequence diagram for describing a sequence of state transitions of the printing apparatus according to the embodiment when power supply is started and when the printing apparatus transitions to an OFF state.

DESCRIPTION OF THE EMBODIMENTS

[0017] Various exemplary embodiments, features, and aspects of the present disclosure will be described hereinafter in detail, with reference to the accompanying drawings. It is to be understood that the following embodiments are not intended to limit the claims of the present disclosure, and that not all of the combinations of the aspects that are described according to the following embodiments are necessarily required with respect to the means to solve the issues according to the present disclosure. Further, in the accompanying drawings, the same or similar configurations are assigned the same reference numerals, and redundant descriptions are omitted. The following describes a printing apparatus in which an ink-jet printing method is used as an example of an image printing apparatus according to the present disclosure, but the present disclosure is not limited to this example.

[0018] First, terms used in the present embodiment are defined in advance as follows.

Record

[0019] In this specification, the term "record" means not only the formation of information that has meanings, such as letters and figures. This term refers to the formation of any information irrespective of whether or not the information has meanings and irrespective of whether or not the information is made visible so that a person can visually recognize it. This term widely refers to the formation of an image, a design, a pattern, or the like on a recording medium and processing of the medium.

Recording Medium

[0020] The term "recording medium" not only refers to paper that is used in common printing apparatuses but also widely refers to mediums that can receive ink, such as cloth, plastic films, metal plates, glass, ceramics, wood, and leather.

Ink

[0021] The term "ink" is intended to be widely interpreted similarly to the above definition of

"record", and refers to mediums including recording materials that can be used in the formation of an image, a design, a pattern, or the like by being applied onto a recording medium, or used in processing of the recording medium or ink treatment. The ink is liquid. The ink treatment mentioned above is solidification or insolubilization of a coloring material contained in the ink applied to the recording medium, for example.

Nozzle

[0022] The term "nozzle" refers to an ejection port unless otherwise stated. A liquid path extends through the inside of the nozzle, and an element that generates energy to be used to eject ink is provided inside the nozzle.

Scan

[0023] A recording head scans a recording medium to perform recording on the recording medium. Here, movement of the head for recording or movement of the head during acceleration or deceleration of the head relating to recording is referred to as "scanning".

[0024] FIG. **1** depicts a perspective view of the external appearance of a printing apparatus **500** according to an embodiment of the present disclosure.

[0025] The printing apparatus **500** includes a housing (exterior unit) **501**, recording heads (not shown) that perform a recording operation on a recording medium, and ink tanks **502** that are ink housing containers for housing ink to be supplied to the recording heads. The ink tanks **502** are provided at the front side of the housing **501**, and the recording heads and the ink tanks **502** are respectively connected by ink flow paths corresponding to respective colors of ink. A black ink tank **502***a* is provided on the left as viewed from the front side of the printing apparatus **500**, and a cyan ink tank **502***b*, a magenta ink tank **502***c*, and a yellow ink tank **502***d* are provided on the right as viewed from the front side of the printing apparatus **500**. The printing apparatus **500** also includes a sheet tray **503** and a sheet cassette **504** as feeding units to take a recording medium into the printing apparatus **500**. A recorded recording medium is discharged from a discharge portion **505** to the outside of the printing apparatus **500**. Also, the printing apparatus **500** includes a sheet feeding motor (not shown) for feeding the recording medium from the sheet tray **503** or the sheet cassette **504** and a motor (not shown) for driving the recording heads in a scanning direction. Furthermore, the printing apparatus **500** includes a motor (not shown) for driving a conveyance roller for conveying the recording medium, and a scanner motor (not shown) used for scanning of a scanner sensor, for example.

[0026] The printing apparatus **500** also includes a console unit **506** that is used by a user to perform operations for inputting instructions or the like. It is possible to cause the printing apparatus **500** to transition to an ON state or an OFF state by operating a power key **107** included in the console unit **506**.

[0027] FIG. **2** is a block diagram for describing a schematic configuration of a power control integrated circuit (IC) **100** according to the embodiment of the present disclosure. The power control IC **100** functions as a power control device and is formed on a circuit board on which a circuit (not shown) that controls power supply in the printing apparatus **500** is mounted.

[0028] A power saving OFF state can be realized by the power control IC **100**. In the embodiment, a standby state in which the apparatus is turned on in response to a user operation is referred to as an "OFF state (soft OFF state)", and this OFF state is a power saving state in which power is supplied from the power control IC **100** in the apparatus. Also, a state in which power is not supplied from the power control IC **100** on the apparatus (i.e., a power supply **102** does not output power) is referred to as the "power saving OFF state (power saving OFF)".

[0029] The power control IC **100** generates power supplied to a main controller **108** of the printing apparatus **500** and various units and components included in the apparatus such as various sensors and light emitting diodes (LEDs), although these are not shown in FIG. **2**. The power control IC **100** includes a controller **101** that controls the power control IC **100** and the power supply **102** that generates output power. Furthermore, the power control IC **100** includes an IC power supply

generator **103** that generates internal power supply that is used for pull-up of a communication signal transmitted to the controller **101** or inside the power control IC **100** and various sensor signals from an external power supply switch or the like. Also, the power control IC **100** includes a register controller **104** for controlling a register that holds settings of the power control IC **100**, statuses of input signals, and the like.

[0030] The controller **101** controls the entire power control IC **100**, and controls output from the power supply **102** and performs control based on settings held by the register of the register controller **104**. Furthermore, the controller **101** controls operations of the power control IC **100** based on a reset signal **106** input from a control IC provided outside the power control IC **100** and a user operation made on the power key **107** or the like. When power is supplied from a power supply unit (PSU) **105** to the power control IC **100**, internal power supply in the power control IC **100** is started, and a reset state is canceled. The power control IC **100** enters the reset state when the reset signal **106** is asserted (becomes a low level).

[0031] The power supply **102** includes direct current to direct current (DC/DC) converters and a regulator such as a low drop out (LDO) regulator and is controlled by the controller **101**. A timing at which the power supply **102** outputs power can be set in accordance with settings held by the register of the register controller **104** such that the power supply **102** starts an output of power after power is supplied from the power supply unit **105** and the reset signal **106** is canceled, as described later with reference to FIG. **3**. Alternatively, the power supply **102** may be configured to start an output of power in accordance with settings held by the register of the register controller **104** when an operation for causing transition to the ON state is input with use of the power key **107** or the like.

[0032] The register controller **104** holds a setting regarding the output timing of the power supply **102** (DC/DC converters), and the register controller **104** can hold the setting value in the register even when power is not supplied from the power supply unit **105**. Note that the register (memory) of the register controller **104** in which setting values are stored is not limited to a non-volatile memory and may also be a volatile memory. If the register is a volatile memory, control may also be performed to set output settings of the power supply **102** after power is supplied from the power supply unit **105**. If the printing apparatus **500** starts operation at the timing at which power is supplied from the power supply unit **105**, the power supply **102** outputs power when power supply from the power supply unit **105** is started. Then, after the printing apparatus **500** is initialized by the main controller **108**, the state where power is supplied from the power supply unit **105** is stored in the register controller **104**. Then, the printing apparatus **500** may be caused to transition to the power saving OFF state that is a standby state with low power consumption by changing a setting in the register controller **104** to a setting for keeping the power supply **102** from outputting power.

[0033] In the power saving OFF state in which power is not supplied from the power control IC **100**, the power supply **102** is on standby without outputting power while the printing apparatus **500** is on standby in the OFF state. Therefore, power consumption can be reduced while the printing apparatus **500** is on standby. Although the power supply **102** shown in FIG. **2** includes three DC/DC converters and one LDO (regulator), there is no particular limitation on the number of DC/DC converters and the number of regulators and the combination thereof, and the power supply **102** may include one or more DC/DC converters and a plurality of regulators. Alternatively, the power supply **102** may include only one or more DC/DC converters, or only one or more regulators.

[0034] The power supply **102** can generate output power by inputting output of a DC/DC converter to another DC/DC converter or the LDO (regulator). DC power supplied from the power supply unit **105** is input to the DC/DC converter of the power supply **102**, e.g., power of 32 V or 24 V (volts) is input to the power supply **102**. As for output voltages of the DC/DC converters, for example, ch1 (DC/DC ch1) of the DC/DC converters outputs 5 V (5V series of power supply) in the printing apparatus **500**. Then, the output 5 V is input to DC/DC ch2 and DC/DC ch3, which

generate 3.3 V (3V series of power supply) and 1.1 V or 0.9 V (1V series of power supply), respectively. Furthermore, the 3.3 V output from the DC/DC ch2 is input to the LDO, and thus, output power of 1.5 V (memory power supply) is obtained. As for applications of the respective series of power supply, the 5V series of power supply is used to light LEDs and used as power supply for an external booster circuit, for example. Also, the 3V series of power supply is used for communication between the power control IC **100** and the main controller **108** and used as power supply for various sensors, analog signals, and a ROM, for example. The 1V series of power supply is used for internal control of the main controller **108**, for example. Furthermore, the 1.5V series of power supply is used for ROM/RAM communication and analog signals, for example. Note that, other than the configuration in which the DC/DC ch3 outputs the 1V series of power supply, a configuration is also possible in which the DC/DC ch3 may generate 1.5 V, which is input to the LDO to generate 1V series of power supply such as 0.9 V.

[0035] If the power supply **102** includes two DC/DC converters and two regulators (LDO), 5 V (5V series of power supply) and 3.3 V (3V series of power supply) are generated by the DC/DC ch1 and the DC/DC ch2. Then, 1.1 V (1V series of power supply) and 1.5 V may be generated with use of the two regulators by inputting the generated 3.3 V or 5 V to the two regulators.

[0036] It is possible to switch the maximum power (current) that can be output from the DC/DC converters, and when it is desired to reduce power consumption, the power consumption can be reduced by suppressing a chopping frequency of the DC/DC converters or causing the DC/DC converters to perform intermittent operations. When the printing apparatus **500** is in a mode in which the printing apparatus **500** consumes a large amount of current, it is also possible to increase the maximum supply current by increasing the chopping frequency of the DC/DC converters.

[0037] The IC power supply generator **103** can generate a desired voltage, and can generate various voltages such as the 5V series of power supply, the 3V series of power supply, and the 1V series of power supply, which are commonly used. The IC power supply generator **103** can generate a plurality of voltages, and a configuration is also possible in which the IC power supply generator **103** generates only one series of power supply such as the 3V series of power supply. Also, the IC internal power supply can be output from the power control IC **100** to the outside, and can be used as power supply for external sensors or the like and pull-up power supply for the reset signal **106**, which will be described later, and a signal input via the power key **107** even when power is not output from the power supply **102**.

[0038] The register controller **104** holds setting values of the power control IC **100** such as settings regarding output and non-output from the various DC/DC converters and the LDO included in the power supply **102**. Also, the register controller **104** has a memory function for holding values of input signals and various setting values of the register and the like, and the memory function may be either volatile or non-volatile as described above. For example, the register and setting values that are to be held even when power is not supplied to the power control IC **100** may be configured to be non-volatile, and setting values and input signal values that are used after power supply is started may be configured to be volatile. The register controller **104** can also hold input values and analog signals input from various sensors, which will be described later, and digital values obtained through analog-to-digital conversion of the analog signals. This eliminates the need to supply power to the various sensors and supply power to an IC other than the power control IC **100**, the main controller **108**, and the like to hold the various values. Accordingly, it is possible to detect signals input to the printing apparatus **500** while realizing the standby state with low power consumption.

[0039] Values held by the register controller **104** can be read by the main controller **108** after the printing apparatus **500** is booted can be used to control the printing apparatus **500**. Setting values in the register are usually stored in memory regions by assigning an address to each of various settings. However, when it is desired to downsize the register region, it is also possible to allocate one bit to each setting value rather than assigning addresses to the setting values, and thus

downsize the memory region and reduce the amount of memory. There is no limitation on a data region of the register controller **104**, and a configuration is possible in which a data region is allocated to an address of each function or one bit is allocated to each function.

[0040] When the power supply unit **105** is connected to a commercial power supply, power is supplied to the power control IC **100**. The power supply unit **105** converts AC power supplied from a common electrical outlet or the like to DC power and supplies the DC power. For example, the power supply unit **105** converts AC power of 100 V or 240 V to DC power of a voltage suitable for use in the printing apparatus **500** including the power control IC **100**, such as 32 V or 24 V. There is no limitation to the configuration in which DC power is supplied from the power supply unit **105**, and the power control IC **100** may also be caused to operate with power supplied from a power supply unit such as a battery (not shown).

[0041] When power is supplied from the power supply unit **105** or the like and the reset signal **106** becomes a high level, the power control IC **100** enters a reset canceled state and is enabled to operate. In FIG. **2**, the reset signal **106** is pulled up with the power supply output from the IC power supply generator **103** of the power control IC **100**, but it is also possible to pull up the reset signal **106** with use of a peripheral circuit provided outside the power control IC **100**.

[0042] The power key **107** supplies an input signal for causing the printing apparatus **500** including the power control IC **100** to transition from the OFF state to the ON state or from the ON state to the OFF state. The power key **107** may be constituted by a self-reset type switch whose contact changes only when the power key **107** is pressed, a contact switching switch, or the like. Also, the power key **107** switches the contact with use of a physical mechanism, but it is also possible to use a power key in which a mechanism other than the electrical contact is used, such as a capacitance-type switch or an optical switch. In FIG. **2**, a signal from the power key **107** is pulled up with the power supply from the IC power supply generator **103** of the power control IC **100**, but it is also possible to pull up the signal with use of a peripheral circuit provided outside the power control IC **100**.

[0043] The power control IC **100** according to the embodiment includes a detection unit for detecting a transition signal input via the power key **107** or the like. This configuration enables the printing apparatus **500** to transition between the ON state and the OFF state even if power is not supplied to the main controller **108** that determines transitions of a power supply state of the printing apparatus **500**.

[0044] The main controller **108** is an apparatus controller that controls the printing apparatus **500** for which power supply is controlled by the power control IC **100**, and the main controller **108** is connected to the power control IC **100** via a control line. In FIG. **2**, the main controller **108** is connected to the controller **101** and the register controller **104** via bus connection. However, the control line is also possible to use a serial signal such as a differential signal, a parallel signal, or a general-purpose IF such as SPI-I2C for the control line. The main controller **108** includes a control unit including a control IC such as an application specific integrated circuit (ASIC) or a CPU and a peripheral circuit such as a memory, as described later with reference to FIG. **3**. Other than the configuration including a peripheral circuit, the control unit may also have a configuration including only an integrated circuit in which a plurality of functions is implemented, or the control unit may include an IC and a peripheral circuit, and there is no limitation on the configuration of the control unit. The main controller **108** can communicate with the controller **101** and the register controller **104** of the power control IC **100**. The main controller **108** can transmit and receive various settings by communicating with the controller **101** and transmit and receive setting values by communicating with the register controller **104** via the controller **101** or by directly communicating with the register controller **104**.

[0045] Although FIG. **2** shows a configuration used to perform power saving control of power supply, it is also possible to implement functions other than power supply control in the power control IC **100** as described later with reference to FIG. **3**, for example. The functions may be

implemented in the power control IC **100** or configured as peripheral circuits, and there is no particular limitation on the manner of implementation. Also, the power control IC **100** is described in the embodiment, but a power control unit such as the power control IC **100** may be realized by plural circuit blocks.

[0046] Also, the printing apparatus **500** is described as an example in the embodiment, but the apparatus in which the power control IC **100** is installed is not limited to a printing apparatus, and the power control IC **100** is also applicable to other electronic devices such as a camera.

[0047] Next, the following describes a case where functions other than the functions shown in FIG. **2** are implemented in the power control IC **100** with reference to FIG. **3**.

[0048] FIG. **3** is a block diagram for describing configurations of the main controller **108** and the power control IC **100** in the printing apparatus **500** according to the embodiment. In FIG. **3**, units that are common to FIG. **3** and FIG. **2** described above are denoted with the same reference numbers as those used in FIG. **2**, and descriptions thereof are omitted.

[0049] In FIG. **3**, an analog-to-digital converter (ADC) **201** and a motor controller **202** are implemented in the power control IC **100**, and an analog signal **204** from a thermistor or the like and an input signal from a sensor **205** of various types, which detects operations made by the user, are input as external signals. The thermistor is used to detect an ambient temperature of the printing apparatus **500** and control the apparatus based on the external temperature, for example. Examples of the sensor **205** include a sensor that detects an operation of setting sheets in the sheet cassette, a sensor that detects an operation of setting sheets on the tray, and a sensor that detects an operation of replacing a recording material such as ink in the recording apparatus **500**. The analog signal **204** and the input signal from the sensor **205** may operate with power supplied from the IC power supply generator **103**, power output from the power supply **102**, or power supplied from the outside. The number of analog signals **204** and the number of signals from the sensor **205** input to the power control IC **100** may each be one or two or more, and there is no limitation on the numbers of signals.

[0050] The ADC **201** has a function of converting the input analog signal **204** to a digital signal and a function of sampling the analog signal **204** at constant intervals and converting the sampled signal to a digital signal. The ADC **201** also has a function of averaging the sampled signals and a function of performing various types of computation. For example, when a thermistor signal is input as the analog signal **204** to the ADC **201**, the ADC **201** samples the thermistor signal at predetermined constant intervals and converts the sampled signals to digital signals. Then, a value obtained by performing set computation on the digital signals is held by the power control IC **100**. Thus, a temperature inside or outside the printing apparatus **500** is detected at constant intervals and the detected temperature is held, and the main controller **108** can check the state of the printing apparatus **500** based on the held information when the main controller **108** is booted, or use the information for control, for example.

[0051] Also, the ADC **201** can sample the analog signal **204** with use of the internal power supply from the IC power supply generator **103** even when the printing apparatus **500** is in the power saving OFF state in which power is not output from the power supply **102**. Also, when the main controller **108** is operating, the power control IC **100** can output the input analog signal **204** as it is to the main controller **108**, or the analog signal **204** can be input to the main controller **108** in parallel to perform processing on the analog signal. In the case where the analog signal **204** is input to the power control IC **100** and the main controller **108** in parallel, it is also possible to provide a circuit (not shown) for selecting which of the power control IC **100** and the main controller **108** that input the analog signal **204** in order to separate power supply for the analog signal **204**. It is also possible to perform control by outputting each digital value sampled by the ADC **201** to the main controller **108** when the main controller **108** is operating as well.

[0052] Likewise, the input signal from the sensor **205** can be detected with use of the power supply from the IC power supply generator **103** even when the printing apparatus **500** is in the power

saving OFF state in which power is not output from the power supply **102**. As described above, even when the printing apparatus **500** is in the power saving OFF state, the ADC **201** and the sensor **205** can operate and data from the ADC **201** and the sensor **205** can be held by the register controller **104**. After the printing apparatus **500** has transitioned to the ON state, the main controller **108** reads the data held by the register controller **104**. Accordingly, when the printing apparatus **500** has entered the ON state, the main controller **108** can grasp the content of operations or the like made during the power saving OFF state, which is a low power consumption state.

[0053] For example, if it is possible to detect the fact that sheets were set by the user in the cassette that houses printing paper, the number of set sheets, the size of the sheets, etc., while the printing apparatus **500** is in the power saving OFF state, sheet information has already been detected when the printing apparatus **500** transitions to the ON state. Therefore, there is no need to let the user set sheet information again. In an image capturing apparatus such as a camera, it is possible to detect the fact that a storage medium (e.g., an SD card) was attached or detached or a reproduction button for checking captured images was pressed during the power saving OFF state and hold the detection result. This makes it possible to perform various types of control, such as control for automatically displaying a reproduction screen when the camera transitions to the ON state or after a power key is pressed.

[0054] Next, the following describes a configuration including the motor controller **202** and control of motors **203**.

[0055] The power control IC **100** controls output from the DC/DC converters and the motors **203** with use of a voltage supplied to the power control IC **100**. In the embodiment, the voltage input to the power control IC **100** is used as a common voltage of power input to the DC/DC converters and power used to control the motors **203**. Although a power supply generating IC and a motor control IC are usually constituted by individual ICs and peripheral circuits, this configuration makes it possible to integrate these ICs into the power control IC **100**. This configuration has merits such as a reduction in the area of the circuit board on which the ICs are mounted and saving of the cost due to a reduction in the number of individual ICs. Also, the number of voltages input to the power control IC **100** can be reduced by using the common voltage as the voltage for generating power supply in the power control IC **100** and the voltage for controlling the motors **203**. On the other hand, different voltages may also be input to the power control IC **100** as a voltage for the power supply **102** and a voltage for controlling the motors **203**, and there is no limitation on the number of voltages input to the power control IC **100**.

[0056] Control lines between an ASIC **206** and the motor controller **202** may be configured to connect the ASIC **206** to the motor controller **202** and the register controller **104** in parallel, or a configuration is also possible in which control is performed by switching between motor control and register control. For example, if the control line from the main controller **108** is connected in parallel, motor control is performed via the control line while each of the motors **203** is controlled. When none of the motors **203** is controlled (none of the motors **203** is operating), the control line is used for control of the power control IC **100**, such as setting of output settings of the power supply **102**, and thus, the control line can be used as a common control line. Control of the motors **203** and control of the power control IC **100** can be switched with use of a control switching signal transmitted via a connection switching line, or a command designating either the control of each of the motors **203** or the control of the power control IC **100** at the head of a transmission command of a control signal, when the control switching signal is not used. The ASIC **206** can also control the motor controller **202** and the register controller **104** via the controller **101**. It is also possible to control the motor controller **202** and the power control IC **100** at the same time by connecting the ASIC **206** to the motor controller **202** and the power control IC **100** separately.

[0057] In the control of the motors **203**, if DC power of 32 V or 24 V is supplied from the power supply unit **105** to the power control IC **100** as described above, it is possible to drive the various motors **203** with the DC power of 32 V or 24 V. The power control IC **100** includes a booster (not

shown) in the power control IC **100** to drive each of the motors **203**, for example. If the power supply unit **105** is a battery such as a lithium ion battery or a power supply, such as an alternating current (AC) adapter, that outputs power of about 5 V or 10 V, the power control IC **100** controls the motor controller **202** and each of the motors **203** with use of a voltage boosted by the booster (not shown). The booster may also be configured as a circuit (booster circuit) that is provided outside the power control IC **100** and supplies the boosted voltage to the power control IC **100**. The voltage output from the booster or the boosting circuit can be used for purposes other than the control of each of the motors **203**, such as power supply to the power control IC **100** to be input to the power supply **102** or the IC power supply generator **103**. A configuration is also possible in which the boosted voltage is used for the control of each of the motors **203**, and the voltage prior to be boosted is used for power supply to the DC/DC converters of the power supply **102**.

[0058] A plurality of motors **203** are used in many products. For example, the sheet feeding motor for feeding sheets from the sheet tray or the sheet cassette, the motor for driving the recording heads in the scanning direction, the motor for driving a roller for conveying sheets, and the scanner motor used for scanning of the scanner sensor are mainly used in the printing apparatus **500**. In an image capturing apparatus such as a camera, motors are used for control of a lens barrel, focusing, and control of a shutter, for example. The motors **203** may be DC motors or stepping motors, and there is no limitation on the type of the motors. FIG. **3** shows four motors **203**, but there is no limitation on the number of motors, and actually, the number of motors may be one, or two or more.

[0059] The motor controller **202** is connected to the ASIC **206** by a control line and can be directly controlled by the ASIC **206**. It is possible to adopt a configuration in which the control line is separated for each motor as in the case where the ASIC **206** and the motor controller **202** are connected via bus connection, or a configuration in which all motors are controlled with use of serial signal connection. In the case of the bus connection, pairs of a PHASE signal and an ENABLE signal corresponding to respective motors are used according to the number of motors, and signal lines used for control lines of the power control IC **100** are shared by motor control signals. In the case of the serial connection, control is performed by switching between control of the power control IC **100** and control of each of the motors **203** based on a command transmitted by a serial signal.

[0060] Next, the following describes an example of an internal configuration of the main controller **108**. Many functions are implemented in an actual apparatus, and the actual apparatus has a complex structure including a plurality of control ICs, various sensors, operation mechanisms, etc., which cannot be shown in FIG. **3**, but the following describes constituent elements relating to the embodiment. FIG. **3** shows the ASIC **206** as a central IC of the main controller **108**, but a control IC such as a general-purpose CPU or a field programmable gate array (FPGA) may also be used, and there is no limitation to the configuration shown in FIG. **3**.

[0061] The following describes a configuration of the ASIC **206**.

[0062] When power supply to the ASIC **206** is started with power supplied from the power supply **102**, a CPU **209** executes a control program stored in a ROM **207** via a memory controller **210** and starts to control the printing apparatus **500** in accordance with the control program. A key detection unit **208** can detect whether or not the power key **107** is operated via the power control IC **100**. In response to the power key **107** being operated, the printing apparatus **500** can transition to the ON state. At this time, the ASIC **206** can determine whether the printing apparatus **500** transitions from the OFF state to the ON state or from the power saving OFF state to the ON state by reading output settings of the power supply **102** set in the register controller **104**. Likewise, a sensor detection unit **212** can detect the state of the sensor **205** in the printing apparatus **500** via the power control IC **100**. The ASIC **206** detects a change in the state of the sensor **205** as described above, and executes desired processing as appropriate. Furthermore, the ASIC **206** can communicate with the power control IC **100** via a communication interface (I/F) **211**. The communication I/F **211** controls

communication performed via a universal serial bus (USB) in the printing apparatus **500** or a wired or wireless LAN, as well as communication with the power control IC **100**. I2C or universal asynchronous receiver transmitter (UART) interface protocols may be used in this communication, or the ASIC **206** and the power control IC **100** may also be connected via high-speed communication using a differential signal or PCIe, for example. The communication protocol of the communication I/F **211** is determined according to the circumstances of the printing apparatus **500**.

[0063] When power is supplied to the ASIC **206**, the power control IC **100** transmits the state of the power key **107** to the key detection unit **208** of the ASIC **206** to enable the ASIC **206** to detect an operation made on the power key **107**. Likewise, the state of the sensor **205** is transmitted to the sensor detection unit **212** of the ASIC **206** to enable the ASIC **206** to detect the state of the sensor **205**. The state where power is supplied to the ASIC **206** includes the ON state (operating state) in which the user can operate the printing apparatus **500** and the OFF state, and a state where power is not supplied to the ASIC **206** is the power saving OFF state.

[0064] It is possible to switch whether or not to supply power to various internal circuits included in the power control IC **100**. For example, when power is supplied from the power supply **102** to the main controller **108** and the like in the OFF state but the motors **203** are not controlled, it is possible to stop power supply to the motor controller **202** and the motors **203** to reduce standby power consumption of the printing apparatus **500**. Note that stopping power supply to the motor control system is an example, and the power control IC **100** can stop unnecessary power supply as appropriate to reduce power consumed by the printing apparatus **500**.

[0065] FIG. **4** is a flowchart for describing an example of transition of the state of the printing apparatus **500** according to the embodiment when external power is supplied to the printing apparatus **500**.

[0066] As described above, the printing apparatus **500** can enter the following three states. A first state is the ON state in which power is supplied from the power supply **102** to the main controller **108** (ASIC **206**) after power is supplied from the external power supply unit **105**, and the printing apparatus **500** can operate. A second state is the OFF state in which power is supplied from the power supply **102** to the main controller **108** (ASIC **206**) but operations of the printing apparatus **500** are stopped, and the printing apparatus **500** is on standby for transition to the ON state. For example, the second state is a state in which it is desirable to perform pre-operation processing such as initialization processing for causing the printing apparatus **500** to enter an operable state. A third state is the power saving OFF state in which power supply from the power supply **102** to the main controller **108** (ASIC **206**) is stopped, and the printing apparatus **500** is on standby for transition to the ON state.

[0067] In the embodiment, a power saving state in which power saving control is performed on functional blocks that are not used due to no operation being performed for a while is also referred to as the ON state, in addition to the ON state in which the user can operate the printing apparatus **500** via a display unit such as the console unit **506**. Furthermore, a standby state in which the printing apparatus **500** can transition to the ON state upon receiving an operation job from the communication I/F **211** such as a USB or a wireless LAN, although nothing is displayed on the display unit, is also referred to as the ON state. This standby state is a mode in which the printing apparatus **500** can be operated when power is supplied to the main controller **108** (ASIC **206**). Also, a state where the printing apparatus **500** transitions to the ON state, in which the printing apparatus **500** can operate, upon accepting specific processing in a minimum power consumption state in which power supply to the main controller **108** (ASIC **206**) is stopped is referred to as the power saving OFF state.

[0068] First, power is supplied from the outside to the power supply unit **105** in step S**401**. If the power supply unit **105** is a battery, for example, this is a state where the battery is connected. If the power supply unit **105** is an AC adapter, this is a state where the power supply unit **105** is connected to a commercial power supply. Next, in step S**402**, a power supply voltage generated by

the power supply unit **105** is supplied to the power control IC **100**. As a result, internal power supply is generated and output by the IC power supply generator **103**, and the reset state of the power control IC **100** is canceled.

[0069] Next, in step S**403**, the controller **101** of the power control IC **100** determines whether or not the power supply **102** is set to output power based on setting values held by the register controller **104**. If the power supply **102** is set to output power (DC/DC output setting is ON), the processing proceeds to step S**404** and the power supply **102** (the DC/DC converters and LDO) is caused to operate and output power. On the other hand, if the power supply **102** is set so as not to output power (DC/DC output setting is OFF), the processing proceeds to step S**410** and the printing apparatus **500** transitions to the power saving OFF state in which the power supply **102** does not supply power.

[0070] The DC/DC output setting is determined based on setting values held by the register controller **104**, and the setting values include timings at which power is output from the DC/DC converters and the LDO included in the power supply **102** and the order in which the DC/DC converters and the LDO output power. Accordingly, the controller **101** performs control such that power is output in accordance with the setting values. The printing apparatus **500** can switch, based on the output setting of the power supply **102**, between transition to the OFF state in which power is supplied to the main controller **108** and transition to the power saving OFF state in which power is not supplied to the main controller **108**.

[0071] In step S**404**, various voltages are generated by the power supply **102** and supplied to units in the printing apparatus **500**, such as the main controller **108**.

[0072] Next, in step S**405**, the main controller **108** (ASIC **206**) starts processing in accordance with the control program stored in the ROM **207** in response to power supply being started. For example, the main controller **108** loads data into the RAM **207**, initializes modules implemented in the ASIC **206**, such as the communication I/F **211** and the memory controller **210** to make the modules usable, and prepares for booting, for example. Next, in step S**406**, after the preparation for booting is complete, the printing apparatus **500** transitions to a standby state (soft OFF state) before transitioning to the ON state. In this standby state, it is possible to reduce power consumption by changing output of the power supply **102** from a normal mode to a low power consumption mode in which the chopping frequency is suppressed.

[0073] Then, in step S**407**, the printing apparatus **500** waits for a transition signal for causing transition to the ON state to be input through a pressing operation made on the power key **107** or the like. In response to the pressing operation made on the power key **107** or input of the transition signal such as a signal for booting the printing apparatus **500**, the processing proceeds to booting processing performed in step S**408**. On the other hand, if no transition signal has been input, the printing apparatus **500** maintains the standby state waiting for input of the transition signal in step S**407**.

[0074] In step S**408**, the main controller **108** performs processing (booting processing) for causing the printing apparatus **500** to transition to the ON state. For example, the main controller **108** turns on display units such as an LCD of a user interface and LEDs and initializes mechanical operation mechanisms such as the motors **203**. Also, if the power supply **102** has been set to the low power consumption mode, the mode is changed to the normal output mode, for example. Then, in step S**409**, the printing apparatus **500** is caused to transition to the ON state in which the user can operate the printing apparatus **500**. If it is determined that there is no need to maintain the operable state after proceeding to step S**409**, the printing apparatus **500** may enter a power saving standby state in which display on the display units is ceased or the output from the power supply **102** is changed from the normal output mode to the low power consumption mode in which the chopping frequency is suppressed.

[0075] On the other hand, if the power supply **102** is set so as not to output power in step S**403**, the processing proceeds to step S**410** and the printing apparatus **500** transitions to the power saving

OFF state in which the power supply **102** does not supply power to the main controller **108** (ASIC **206**). In this power saving OFF state, power is not supplied from the power control IC **100** to various devices and units, and accordingly, it is possible to realize a low power consumption state. Then, in step S**411**, the printing apparatus **500** waits for a transition signal for causing transition to the ON state to be input via the power key **107** or the like, similarly to step S**407**. If the transition signal is input, the processing proceeds to step S**412**, and various voltages are generated by the power supply **102** and supplied to units in the printing apparatus **500**, such as the main controller **108**, similarly to step S**404**. Thus, power is supplied to the main controller **108**, and the main controller **108** initializes the modules to make the modules usable in step S**413** similarly to step S**405**, and then the processing proceeds to step S**408**. Then, the booting processing is performed in step S**408**, and the printing apparatus **500** transitions to the ON state in step S**409**.

[0076] Through this processing, when power supply is started, the printing apparatus **500** can transition to the OFF state, which is a standby state for waiting for transitioning to the ON state, or the power saving OFF state, which is a standby state for waiting for transitioning to the ON state, based on the setting values held by the register controller **104**. In the power saving OFF state, the power control IC **100** operates with internal power supply that is generated by the IC power supply generator **103** and saves power, and therefore, it is possible to further reduce power consumption of the entire apparatus in the standby state.

[0077] FIG. **5** is a flowchart for describing processing performed when the printing apparatus **500** according to the embodiment transitions from the operable state to a standby state.

[0078] Step S**501** corresponds to the ON state in step S**409** shown in FIG. **4**. Next, in response to a signal for causing transition to the OFF state, e.g., a pressing operation made on the power key **107**, being detected in the ON state (operable state) in step S**502**, the processing proceeds to step S**503**. In step S**503**, the controller **101** of the power control IC **100** determines, based on setting values held by the register controller **104**, whether or not the output setting of the power supply **102** is set such that the power supply **102** outputs power. If the power supply **102** is set to output power (DC/DC output setting is ON), the processing proceeds to step S**504**, and if the power supply **102** is set so as not to output power, the processing proceeds to step S**506**.

[0079] In step S**504**, the main controller **108** performs processing for causing the printing apparatus **500** to transition to the OFF state. Here, the display units such as the LCD of the user interface and LEDs are turned off and the mechanical operation mechanisms such as the motors **203** are initialized, for example. Also, the controller **101** changes the mode of the power supply **102** from the normal output mode to the low power consumption mode, for example. After the processing for transitioning to the OFF state is finished, the printing apparatus **500** is caused to transition to the OFF state (standby state) in step S**505**, and then the processing ends.

[0080] On the other hand, in step S**506**, the main controller **108** starts transition of the printing apparatus **500** to the power saving OFF state. At this time, the display units such as the LCD of the user interface and LEDs are turned off and the mechanical operation mechanisms such as the motors **203** are initialized similarly to step S**504**, and processing for recording the transition of the power control IC **100** to the power saving OFF state in the register controller **104** is performed. If the transition is recorded, it is possible to determine whether the printing apparatus **500** is in a state right after power supply from the power supply unit **105** is started or the printing apparatus **500** transitioned to the power saving OFF state in a state where the power supply had already been started. This makes it possible to change processing performed when the printing apparatus **500** is booted as described above. After the processing in step S**506** is finished, the controller **101** of the power control IC **100** stops output from the power supply **102** to stop power supply to the main controller **108** (ASIC **206**) in step S**507**. Then, in step S**508**, the printing apparatus **500** transitions to the power saving OFF state in which the printing apparatus **500** waits for a transition signal for causing transition to the ON state to be input via the power key **107** or the like, and then the processing ends.

[0081] FIG. **6** is a sequence diagram for describing a sequence of state transitions of the printing apparatus **500** according to the embodiment when power supply is started and when the printing apparatus **500** transitions to the OFF state.

[0082] First, in response to power being supplied from the outside to the power supply unit **105** in step S**601**, the reset state of the power control IC **100** (controller **101**) is canceled in step S**602**. In FIG. **6**, reference number **630** denotes a case where the DC/DC output setting is ON according to setting values held by the register controller **104**, and reference number **640** denotes a case where the DC/DC output setting is OFF.

[0083] If the DC/DC output setting is ON, in step S**603**, the controller **101** instructs the power supply **102** to output power in accordance with the setting values held by the register controller **104**. In response to the instruction, the power supply **102** starts to output power in step S**604**. When power is supplied to the main controller **108** in step S**605**, the main controller **108** executes the initial setting described above for step S**405** in step S**606**, and then, in step S**607**, the printing apparatus **500** transitions to the standby state before transitioning to the ON state, as described above for step S**406**. In response to the power key **107** being pressed in step S**608**, the booting processing is executed in step S**609** similarly to step S**408**, and the printing apparatus **500** transitions to the ON state.

[0084] On the other hand, if the DC/DC output setting is OFF, the printing apparatus **500** keeps on standby in the power saving OFF state in which power is not output from the power supply **102**, i.e., the main controller **108** does not operate. In response to the power key **107** being pressed in step S**610**, the power supply **102** is instructed to output power in step S**611**. In response to the instruction, various voltages are generated by the power supply **102** and supplied to units in the printing apparatus **500**, such as the main controller **108**, in step S**612**. Thus, power is supplied to the main controller **108** in step S**613**. In step S**614**, the main controller **108** executes the initial setting described above for step S**405**, and after finishing the initial setting, executes the booting processing in step S**615**, and the printing apparatus **500** transitions to the ON state.

[0085] Next, the following describes cases where the printing apparatus **500** transitions from the ON state to a standby state. Reference number **650** denotes a case where the DC/DC output setting is ON according to the setting values held by the register controller **104**, and reference number **660** denotes a case where the DC/DC output setting is OFF.

[0086] In response to the power key **107** being pressed while the printing apparatus **500** is in the ON state, the pressing on the power key **107** is detected by the controller **101** and the main controller **108** in step S**616**. If the DC/DC output setting is ON, in step S**617**, the controller **101** of the power control IC **100** instructs the power supply **102** to change the mode from the normal output mode to the low power consumption mode. In response to this instruction, the power supply **102** changes the mode from the normal output mode to the low power consumption mode in step S**618**. Also, upon detecting the pressing on the power key **107**, the main controller **108** performs processing for transitioning to the OFF state in step S**619** by turning off the display units such as the LCD of the user interface and LEDs and initializing the mechanical operation mechanisms such as the motors **203**, for example. Thus, the printing apparatus **500** is caused to transition to the OFF state (standby state).

[0087] On the other hand, if the DC/DC output setting is OFF, in response to the power key **107** being pressed, the pressing on the power key **107** is detected by the controller **101** and the main controller **108** in step S**620**. Upon detecting the pressing, the main controller **108** performs processing for turning off the display units such as the LCD of the user interface and LEDs and initializes the mechanical operation mechanisms such as the motors **203**. Then, in step S**621**, the main controller **108** performs processing for recording the transition of the power control IC **100** to the power saving OFF state in the register controller **104**. In step S**622**, the controller **101** records information regarding this transition and the like in the register controller **104**. Then, in step S**623**, the controller **101** causes the power supply **102** to stop outputting power. In step S**624**, the power

supply **102** stops outputting power. Consequently, power supply to the main controller **108** (ASIC **206**) is also stopped in step S**625**. Then, in step S**626**, the main controller **108** transitions to the power saving OFF state in which the main controller waits for a transition signal for causing transition to the ON state to be input via the power key **107** or the like as described for step S**508**.

[0088] In the above embodiment, an example of an ink-jet printing apparatus is described, but the present disclosure can be applied not only to an ink-jet printing apparatus. The present disclosure can be applied not only to a printing apparatus but also to any product for which it is desired to reduce standby power consumption, e.g., a camera or a portable phone such as a smartphone in which a battery is used. For example, if the present disclosure is applied to an air purifier, a sensor is provided on a cover that holds a filter, and opening and closing of the cover in the power saving OFF state are recorded. In this case, when the air purifier transitions from the power saving OFF state to the ON state, it is possible to give a message to the user to confirm whether or not the user replaced the filter.

Other Embodiments

[0089] Embodiments of the present disclosure can also be realized by a computer of a system or apparatus that reads out and executes computer executable instructions (e.g., one or more programs) recorded on a storage medium (which may also be referred to more fully as a 'non-transitory computer-readable storage medium') to perform the functions of one or more of the above-described embodiments and/or that includes one or more circuits (e.g., application specific integrated circuit (ASIC)) for performing the functions of one or more of the above-described embodiments, and by a method performed by the computer of the system or apparatus by, for example, reading out and executing the computer executable instructions from the storage medium to perform the functions of one or more of the above-described embodiments and/or controlling the one or more circuits to perform the functions of one or more of the above-described embodiments. The computer may comprise one or more processors (e.g., central processing unit (CPU), micro processing unit (MPU), or the like) and may include a network of separate computers or separate processors to read out and execute the computer executable instructions. The computer executable instructions may be provided to the computer, for example, from a network or the storage medium. The storage medium may include, for example, one or more of a hard disk, a random-access memory (RAM), a read only memory (ROM), a storage of distributed computing systems, an optical disk (such as a compact disc (CD), digital versatile disc (DVD), or Blu-ray Disc (BD)™), a flash memory device, a memory card, and the like.

[0090] While the present disclosure includes exemplary embodiments, it is to be understood that the disclosure is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

[0091] This application claims the benefit of priority from Japanese Patent Application No. 2024-023036, filed Feb. 19, 2024, which is hereby incorporated by reference herein in their entirety.

Claims

1. An image printing apparatus comprising: a recording head configured to eject a liquid toward a recording medium; a control circuit board that includes a control integrated circuit (IC) configured to control the image printing apparatus; and a power control circuit board that includes a power control IC configured to control power supplied to the control circuit board, wherein the power control IC is capable of entering a first state in which the power control IC outputs power to the control circuit board and a second state in which the power control IC does not output power to the control circuit board, and the power control IC detects a transition signal that causes transition between the first state and the second state.

2. The image printing apparatus according to claim 1, wherein the power control circuit board

further includes at least one direct current to direct current (DC/DC) converter for outputting power to the control circuit board.

3. The image printing apparatus according to claim 2, wherein the power control circuit board further includes at least one regulator for outputting power to the control circuit board.

4. The image printing apparatus according to claim 1, wherein the transition signal is input in response to a power key of the image printing apparatus being pressed.

5. The image printing apparatus according to claim 1, wherein the transition signal is input in response to a booting signal.

6. The image printing apparatus according to claim 1, further comprising: a motor control IC configured to control a motor, wherein the motor control IC is provided on the power control circuit board.

7. The image printing apparatus according to claim 1, wherein the power control circuit board further includes a power supply unit that generates internal power supply to be used in the power control circuit board when the power control circuit board is connected to a commercial power supply or a battery.

8. The image printing apparatus according to claim 1, further comprising: a storage that stores information for controlling the first state and the second state, wherein the information includes a setting indicating whether or not to output power to the control circuit board.

9. The image printing apparatus according to claim 8, wherein the first state includes: a state in which power is supplied to the control circuit board and the image printing apparatus is in an operable state; and a state in which power is supplied to the control circuit board but operations of the image printing apparatus are stopped and the image printing apparatus waits for transition to the operable state, and the second state includes a state in which power supply to the control circuit board is stopped and the image printing apparatus waits for transition to the first state.

10. The image printing apparatus according to claim 9, wherein, if the information includes a setting indicating that power is not to be supplied to the control circuit board, the power control IC performs control to cause the image printing apparatus to transition to the second state, and upon detecting input of the transition signal in the second state, the power control IC performs control to cause the image printing apparatus to transition to the first state.

11. The image printing apparatus according to claim 9, wherein the power control circuit board includes at least one direct current to direct current (DC/DC) converter, and the state in which the image printing apparatus waits for transition to the operable state is a state in which a chopping frequency of the DC/DC converter is reduced compared with the first state.

12. The image printing apparatus according to claim 1, wherein the second state is a power saving OFF state in which the image printing apparatus consumes less power compared with the other states.

13. The image printing apparatus according to claim 9, wherein, when input of the transition signal is detected in the first state, if the information includes a setting indicating that power is not to be supplied to the control circuit board, the power control IC performs control to cause the image printing apparatus to transition to the state in which the image printing apparatus waits for transition to the operable state.

14. The image printing apparatus according to claim 9, wherein, when input of the transition signal is detected in the first state, if the information includes a setting indicating that power is to be supplied to the control circuit board, the power control IC performs control to cause the image printing apparatus to transition to the second state.

15. The image printing apparatus according to claim 8, wherein the control IC causes the storage to store a power supply state of the image printing apparatus.

16. The image printing apparatus according to claim 15, wherein the information includes a setting indicating whether or not to supply power to the control circuit board.

17. The image printing apparatus according to claim 16, wherein, if the information includes a

setting indicating that power is to be supplied to the control circuit board, the power control IC performs control to supply power to the control IC.

18. The image printing apparatus according to claim 15, wherein the information further includes information indicating whether or not power is supplied from an external power supply when the image printing apparatus is booted.

19. The image printing apparatus according to claim 15, wherein the storage is capable of holding content of an operation made while the image printing apparatus is in a power saving OFF state in which the image printing apparatus consumes less power compared with the other states.

20. A method of controlling an image printing apparatus that includes: a recording head configured to eject a liquid toward a recording medium; a control circuit board including a control integrated circuit (IC) configured to control the image printing apparatus; and a power control circuit board including a power control IC configured to control power supplied to the control circuit board, wherein the power control IC is capable of entering a first state in which the power control IC outputs power to the control circuit board and a second state in which the power control IC does not output power to the control circuit board, the method comprising: detecting a transition signal that causes transition between the first state and the second state; and controlling power supply to the control circuit board in accordance with a detection state of the transition signal.