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PRINTING SYSTEM, PRINTING APPARATUS, AND METHOD OF CHANGING SETTING OF PRINTING SYSTEM

Abstract

A printing system includes a printing apparatus including a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit, a printing unit, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code, and an information processing apparatus including a second radio communication unit configured to perform P2P communication, a reading unit configured to read the special code, and a second control unit configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

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Background/Summary

[0001] The present application is based on, and claims priority from JP Application Serial Number 2024-024355, filed Feb. 21, 2024, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND

1. Technical Field

[0002] The present disclosure relates to a printing system, a printing apparatus, an information processing apparatus, and a method of changing the setting of the printing system.

2. Related Art

[0003] In the related art, a printing system is known that performs various settings of printing apparatuses using an information processing apparatus such as a smartphone.

[0004] For example, WO2014/106882 discloses a device control system that allows for viewing and modifying web service settings of a printing apparatus via a web application running on a web browser.

[0005] However, in order to connect an information processing apparatus and a printing apparatus by means of a web application and to change web service settings of the printing apparatus, the user has been required to operate and start the web application and connect the information processing apparatus and the printing apparatus. This has placed a burden on the user.

SUMMARY

[0006] A printing system of the present disclosure includes a printing apparatus, and an information processing apparatus, in which the printing apparatus includes a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus includes a second radio communication unit configured to perform P2P communication, a reading unit configured to read the special code, and a second control unit configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

[0007] A printing apparatus of the present disclosure includes a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met.

[0008] An information processing apparatus of the present disclosure includes a second radio communication unit configured to perform the P2P communication, a reading unit configured to read the special code, a second control unit configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for

receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

[0009] In a method of changing a setting of a printing system of the present disclosure, the printing system including a printing apparatus and an information processing apparatus, the printing apparatus including a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, and a printing unit configured to print an image on a medium, the information processing apparatus including a second radio communication unit configured to perform the P2P communication, and a reading unit, in which the printing apparatus causes the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus accesses the printing apparatus based on the special code read by the reading unit, causes a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and sends, to the printing apparatus, a changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a diagram illustrating a system configuration of a printing system.

[0011] FIG. 2 is a diagram illustrating an example of an APP screen.

[0012] FIG. 3 is a flowchart of an operation of a printing apparatus.

[0013] FIG. 4 is a flowchart of an operation of an information processing apparatus.

DESCRIPTION OF EMBODIMENTS

[0014] An embodiment of the present disclosure is described below with reference to the accompanying drawings.

1. System Configuration of Embodiment

[0015] FIG. 1 is a diagram illustrating a system configuration of a printing system 1.

[0016] The printing system 1 includes a printing apparatus 100 and an information processing apparatus 200. The information processing apparatus 200 is coupled to the printing apparatus 100 in a wireless manner.

[0017] The printing apparatus 100 is an ink-jet printer. The printing apparatus 100 may be a thermal printer or an SIDM (Serial Impact Dot Matrix) printer. A SIDM printer generates dots by impacting the medium such as recording paper with a wire provided in a printing head through the ink ribbon.

[0018] The information processing apparatus 200 is a smartphone, or a tablet-type or note-type computer, for example.

2. Configuration of Printing Apparatus

[0019] The printing apparatus 100 includes a first radio communication interface 110, a first communication interface 120, an operation panel 130, a printing unit 140 and a first control unit 150. In the following description, the interface is abbreviated as I/F.

[0020] The first radio communication I/F 110 is a radio communication device including an antenna, an RF circuit, a baseband circuit, an encoder/decoder and the like. The first radio communication I/F 110 corresponds to the first radio communication unit.

[0021] The first radio communication I/F 110 executes P2P (Peer to Peer) communication with the information processing apparatus 200. This embodiment describes a case where the first radio communication I/F 110 executes P2P communication with the information processing apparatus

200 in accordance with Wi-Fi direct standard. In addition, the first radio communication I/F **110** operates in an infrastructure mode, and executes radio communication with the information processing apparatus **200** via a Wi-Fi access point not illustrated in the drawing. Wi-Fi is a registered trademark.

[0022] In addition, the first radio communication I/F **110** may be configured to execute short-range wireless communication using Bluetooth, NFC (Near Field Communication), Miracast and the like as P2P communication. Bluetooth is a registered trademark.

[0023] The first communication I/F **120** includes a communication module such as a LAN (Local Area Network) card. The first communication I/F **120** connects to a network not illustrated in the drawing and performs mutual data communication with apparatuses connected to the network. The first communication I/F **120** corresponds to the network communication unit.

[0024] The operation panel **130** receives user operations. The operation panel **130** includes a plurality of buttons such as a power button and an input button, for example.

[0025] The printing unit **140** includes a medium conveyance unit **141**, a carriage **143** and a printing head **145**.

[0026] The medium conveyance unit **141** conveys the medium in a predetermined conveyance direction under the control of the first control unit **150**. The medium conveyance unit **141** includes a roller that rotates to convey the medium, a motor serving as a power source for the rotation and the like, for example. In this embodiment, roll paper is used as the medium.

[0027] The carriage **143**, equipped with the printing head **145**, moves back and forth in a main scanning direction with the power of a carriage motor not illustrated in the drawing.

[0028] The printing head **145** ejects ink to the medium to record the image under the control of the first control unit **150**.

[0029] In this embodiment, the ink-jet printing apparatus **100** is described, but the printing apparatus **100** may be a thermal printer or an SIDM printer.

[0030] The first control unit **150** is a computer apparatus including a first storage unit **160** and a first processor **170**.

[0031] The first storage unit **160** includes memories such as a RAM (Random Access Memory) and a ROM (Read Only Memory). The first storage unit **160** stores firmware **161** executed by the first processor **170**, and a setting file **163**. In addition, the first storage unit **160** is used also as a reception buffer for storing received printing data. The first storage unit **160** corresponds to the storage unit.

[0032] The setting file **163** is a file in which the setting of the printing apparatus **100** is registered. The setting of the printing apparatus **100** includes a password for determining whether to allow execution of the update processing described later, address information set to the printing apparatus **100** and the like, for example. This embodiment describes a case where the address information is an IP address. The setting file **163**, a password and an IP address are registered as preset values.

[0033] The first processor **170** is an arithmetic processing apparatus composed of a CPU (Central Processing Unit) and/or an MPU (Micro Processor Unit). The first processor **170** may be composed of a single processor, or a plurality of processors. In addition, the first processor **170** may be configured to perform a process by a hardware circuit such as an ASIC, or configured such that a processor such as a CPU and an MPU and a hardware circuit perform a process in conjunction with each other.

3. Configuration of Information Processing Apparatus

[0034] The information processing apparatus **200** includes a second radio communication I/F **210**, a camera **220**, a touch panel **230** and a second control unit **250**.

[0035] The second radio communication I/F **210** is a radio communication device including an antenna, an RF circuit, a baseband circuit, an encoder/decoder and the like. The second radio communication I/F **210** executes P2P communication with the printing apparatus **100**. The second radio communication I/F **210** of this embodiment executes P2P communication with the printing

apparatus **100** in accordance with Wi-Fi direct standard. In addition, the second radio communication I/F **210** operates in an infrastructure mode, and executes radio communication with the printing apparatus **100** via a Wi-Fi access point not illustrated in the drawing. The second radio communication I/F **210** corresponds to the second radio communication unit.

[0036] In addition, the second radio communication I/F **210** may be configured to execute short-range wireless communication using Bluetooth, NFC, Miracast and the like as P2P communication.

[0037] The camera **220** includes an imaging lens, an imaging element such as a CCD (Charge Coupled Device) and a CMOS (Complementary MOS), and a data processing circuit. Illustration of the imaging lens, imaging element and data processing circuit is omitted. The camera **220** executes imaging to generate a captured image under the instruction of the second control unit **250**. The camera **220** corresponds to the reading unit.

[0038] The touch panel **230** includes a display panel such as a liquid crystal panel and an organic EL (Electro Luminescence) panel, and a touch sensor overlaid on the display panel. Illustration of the display panel and touch sensor is omitted.

[0039] The touch sensor detects a touch operation at a contact position of a user's finger on the touch panel **230**. The touch sensor outputs to the second control unit **250** an operation signal including coordinate information representing the detected position of the touch operation. In addition, the touch panel **230** may include a hardware button. The touch panel **230** corresponds to the display device. In this embodiment, the information processing apparatus **200** includes the touch panel **230** as a display device, but the information processing apparatus **200** may be externally coupled to a display and the like such that the information processing apparatus **200** displays images on the display.

[0040] The second control unit **250** is a computer apparatus including a second storage unit **260** and a second processor **270**.

[0041] The second storage unit **260** includes a memory such as a RAM and a ROM. The second storage unit **260** stores a control program **261** such as an OS (Operating System) executed by the second processor **270**. In addition, the second storage unit **260** stores a setting change application program and a Webbrowser **263** as an application program. In the following description, an application program is referred to also as APP.

[0042] A setting change APP **265** is an application program that is executed on the Webbrowser **263**, and has a function of changing the setting of the connected printing apparatus **100**.

[0043] The second processor **270** is an arithmetic processing apparatus composed of a CPU and/or an MPU. The second processor **270** may be composed of a single processor, or a plurality of processors. In addition, the second processor **270** may be configured to perform a process by a hardware circuit such as an ASIC, or configured such that a processor such as a CPU and an MPU and a hardware circuit perform a process in conjunction with each other.

4. Operation of Printing System

[0044] When the printing apparatus **100** is activated with the first radio communication I/F **110** set to enable Wi-Fi direct, the first control unit **150** is connected to the information processing apparatus **200** through Wi-Fi direct communication.

[0045] Next, the first control unit **150** determines whether a printing condition set in advance is met. The printing condition set in advance includes the following five conditions. The printing conditions are printing conditions of a special code including the IP address described later.

[0046] 1. No radio communication setting is configured.

[0047] 2. No USB device is coupled to the printing apparatus **100**.

[0048] 3. No Ethernet cable is coupled to the printing apparatus **100**.

[0049] 4. No IP address for network communication is set.

[0050] 5. Wi-Fi is enabled.

[0051] When the above-mentioned five conditions are met, the first control unit **150** prints the special code. When the above-mentioned five conditions are not met, the first control unit **150** does

not print the special code.

[0052] The special code includes the address information of the printing apparatus **100**. The address information is address information of network communication, and is an IP address, for example. In addition, the special code may be a one-dimensional code such as a bar code or a two-dimensional code such as a QR code. In this embodiment, a QR code is used as a special code. In addition, in this embodiment, the special code includes an IP address, but the special code may include an IP address and a password. QR code is a registered trademark.

[0053] The user reads a medium on which a QR code is printed with the camera **220**. The image captured with the camera **220** is input to the second control unit **250**. The second control unit **250** analyzes the input captured image, and acquires information included in the QR code. As described above, the QR code includes the IP address of the printing apparatus **100**.

[0054] When acquiring the IP address included in the QR code, the second control unit **250** activates the Webbrowser **263**, and inputs the acquired IP address of the printing apparatus **100** to the URL of the activated Webbrowser **263** to activate the setting change APP **265**.

[0055] The second control unit **250** that executes the setting change APP **265** connects to the printing apparatus **100** corresponding to the input IP address, and causes it to display a password input screen under the control of the setting change APP **265**. When a password is input to the password input screen, the second control unit **250** sends the input password to the printing apparatus **100**. The printing apparatus **100** performs password authentication by determining whether the password received from the information processing apparatus **200** matches the registered password included in the setting file **163**.

[0056] When the received password matches the registered password, the first control unit **150** sends an authentication completion notification to the information processing apparatus **200**.

[0057] When receiving the authentication completion notification from the printing apparatus **100**, the second control unit **250** displays an APP screen **300** to receive the setting change of the printing apparatus **100**.

[0058] FIG. **2** is a diagram illustrating an example of the APP screen **300**. The APP screen **300** is an example of the operation screen. The APP screen **300** includes a first setting column **310**, a second setting column **320**, a third setting column **330** and a confirm button **350**.

[0059] The first setting column **310** is a setting column for setting whether to print the password. Specifically, it is a setting column for setting whether to print the changed password when the password is changed. The first setting column **310** includes a first radio button **311** and a second radio button **313**. The first radio button **311** is a button to be selected to print the password. The second radio button **313** is a button to be selected to not print the password. After changing the password, the user selects the first radio button **311** through touch operation if the password is to be printed, or selects the second radio button **313** through touch operation if the password is not to be printed.

[0060] The second setting column **320** is a password setting column. The second setting column **320** includes an entry field **321**. If the password is to be changed, the user enters the password to be changed into the entry field **321**.

[0061] The third setting column **330** is an IP address setting column. The third setting column **330** includes a display column **331** and an entry field **333**. In the display column **331**, the current IP address of the printing apparatus **100** is displayed. The entry field **333** allows the user to enter the changed IP address of the printing apparatus **100**. When changing the IP address, the user enters the changed IP address into the entry field **333**.

[0062] When the confirm button **350** is pressed, the second control unit **250** sends a request for changing the setting change of the printing apparatus **100** to the printing apparatus **100**. This change request includes at least one of the password and the IP address received in the APP screen **300**. In addition, when the setting of the first setting column **310** is “print”, the change request including a printing instruction. When the setting of the first setting column **310** is “no print”, the

change request does not include a printing instruction.

[0063] When receiving a change request from the information processing apparatus **200** connected through Wi-Fi direct to execute the setting change APP, the first control unit **150** changes the setting change of the printing apparatus **100**. The first control unit **150** updates the setting of the printing apparatus **100** by rewriting the setting file **163** with at least one of the received password and the IP address.

[0064] Next, the first control unit **150** determines whether a printing instruction is included in the change request. When a printing instruction is included in the change request and the password and the IP address have been changed, the first control unit **150** causes the printing unit **140** to print the QR code including the IP address and the password.

[0065] When the password has been changed but the IP address has not been changed, the first control unit **150** causes the printing unit **140** to print the password. In addition, when the IP address has been changed but the password has not been changed, the first control unit **150** causes the printing unit **140** to print the QR code including the changed IP address.

[0066] In addition, when printing the password and/or the QR code including the IP address, the first control unit **150** may print the current date or the current date, and the time when the password and/or the IP address has been changed. Further, the first control unit **150** may print the model name of the printing apparatus **100**.

[0067] The user can access the printing apparatus **100** by reading the QR code including the changed IP address with the camera **220** of the information processing apparatus **200**. Specifically, the setting of the printing apparatus **100** can be changed by operating the APP screen **300** displayed on the touch panel **230**. In addition, when the IP address has been changed, setting the IP address before the change in the URL of the Webbrowser **263** cannot access the printing apparatus **100**.

[0068] FIG. **3** is a flowchart illustrating an operation of the printing apparatus **100**.

[0069] An operation of the printing apparatus **100** is described below with reference to the flowchart illustrated in FIG. **3**.

[0070] When the power source of the printing apparatus **100** is turned on (step **S1**), the first control unit **150** determines whether the Wi-Fi direct setting is enabled (step **S2**).

[0071] When the Wi-Fi direct setting is disabled (step **S2/NO**), the first control unit **150** terminates this process flow and moves on to other processes.

[0072] When the Wi-Fi direct setting is enabled (step **S2/YES**), the first control unit **150** activates the first radio communication I/F **110** in a Wi-Fi direct mode (step **S3**).

[0073] Next, the first control unit **150** determines whether the printing condition set in advance is met (step **S4**). The printing condition set in advance is not met (step **S4/NO**), the first control unit **150** moves to the determination at step **S6**.

[0074] When the printing condition set in advance is met (step **S4/YES**), the first control unit **150** causes the printing unit **140** to print a QR code including the IP address of the printing apparatus **100** (step **S5**).

[0075] Next, the first control unit **150** determines whether a request for connection in Wi-Fi direct has been received (step **S6**). When a request for connection in Wi-Fi direct has not been received (step **S6/NO**), the first control unit **150** terminates this process flow and moves on to other processes.

[0076] When a request for connection in Wi-Fi direct has been received (step **S6/YES**), the first control unit **150** connects to the information processing apparatus **200** that has sent the connection request through Wi-Fi direct (step **S7**).

[0077] Next, the first control unit **150** determines whether a password has been received from the information processing apparatus **200** connected through Wi-Fi direct (step **S8**). When no password has been received (step **S8/NO**), the first control unit **150** waits until a password is received.

[0078] When receiving a password (step **S8/YES**), the first control unit **150** executes password authentication by determining whether the received password matches the registered password

included in the setting file **163** (step **S9**). When the received password does not match the registered password, the first control unit **150** determines that the password authentication has failed (step **S10/NO**) and requests the information processing apparatus **200** to retransmit the password.

[0079] When the received password matches the registered password, the first control unit **150** determines that the password authentication has been successful (step **S10/YES**), and sends an authentication completion notification to the information processing apparatus **200** (step **S11**).

[0080] Next, the first control unit **150** determines whether a change request has been received (step **S12**). The change request includes at least one of a changed IP address and a password. In addition, when the setting of the first setting column **310** is “print”, the change request includes a printing instruction.

[0081] When no change request has been received (step **S12/NO**), the first control unit **150** waits until a change request is received. In addition, when the connection with the information processing apparatus **200** through Wi-Fi direct is disconnected and/or when a notification of the end of communication is received from the information processing apparatus **200**, the first control unit **150** may release the waiting for reception of the change request to terminate this process flow.

[0082] In addition, when receiving a change request (step **S12/YES**), the first control unit **150** updates the setting file **163** on the basis of at least one of the IP address and the password included in the change request (step **S13**).

[0083] Next, the first control unit **150** determines whether a printing instruction is included in the change request (step **S14**). When no printing instruction is included in the change request (step **S14/NO**), the first control unit **150** terminates this process flow.

[0084] A printing instruction is included in the change request (step **S14/YES**), the first control unit **150** determines whether the password and the IP address have been changed in the update of setting file at step **S13** (step **S15**). When the password and the IP address have been changed (step **S15/YES**), the first control unit **150** causes the printing unit **140** to print the QR code including the changed IP address and the password (step **S16**).

[0085] In addition, when the password and the IP address have not been changed in the update of setting file at step **S13**, (step **S15/NO**), the first control unit **150** determines whether one of the password and the IP address has been changed (step **S17**).

[0086] When one of the password and the IP address has been changed (step **S17/YES**), the first control unit **150** causes the printing unit **140** to print the QR code including the changed IP address or the changed password (step **S18**). In addition, when the password and the IP address have not been changed (step **S17/NO**), the first control unit **150** terminates this process flow.

[0087] Note that, in the above-described flowchart, when the received change request includes a printing instruction, the first control unit **150** prints the QR code including the IP address or the changed password. As another example, it is possible to adopt a configuration in which the change request that is sent from the second control unit **250** to the printing apparatus **100** does not include a printing instruction. In this case, the first control unit **150** determines whether the password or the IP address has been changed such that the password is printed when the password has been changed and that the QR code including the IP address is printed when the IP address has been changed.

[0088] FIG. **4** is a flowchart illustrating an operation of the information processing apparatus **200**.

[0089] An operation of the information processing apparatus **200** is described below with reference to the flowchart illustrated in FIG. **4**.

[0090] The second control unit **250** determines whether the QR code has been read by activating the camera **220** (step **T1**). When no QR code has not been read (step **T1/NO**), the second control unit **250** waits until a QR code is read.

[0091] When a QR code is read by activating the camera **220** (step **T1/YES**), the second control unit **250** acquires the IP address included in the QR code by analyzing the captured image of the

camera **220** (step T2).

[0092] Next, the second control unit **250** activates the Webbrowser **263** (step T3), and inputs the acquired IP address of the printing apparatus **100** to the URL of the activated Webbrowser **263** to execute the setting change APP **265** (step T4). The second control unit **250** that executes the setting change APP **265** connects to the printing apparatus **100** corresponding to the input IP address through Wi-Fi direct (step T5).

[0093] Next, the second control unit **250** executes the activated setting change APP **265** and displays a password input screen (step T6). When no password has been input (step T7/NO), the second control unit **250** waits until a password is input.

[0094] When a password is input in the input screen (step T7/YES), the second control unit **250** sends the input password to the printing apparatus **100** (step T8) and determines whether an authentication completion notification has been received (step T9). When no authentication completion notification has been received (step T9/NO) but a request for retransmission of the password has been received, the second control unit **250** determines that the authentication process has failed and requests reentry of the password (step T6).

[0095] When an authentication completion notification has been received (step T9/YES), the second control unit **250** causes the touch panel **230** to display the APP screen **300** for receiving the setting change of the printing apparatus **100** (step T10) and receives touch operation of the user (step T11). When no touch operation of the touch panel **230** has been received (step T11/NO), the second control unit **250** waits until a touch operation is received.

[0096] When a touch operation on the touch panel **230** has been received (step T11/YES), the second control unit **250** determines whether the received touch operation is an input operation of inputting an IP address and/or a password (step T12). When the received touch operation is an input operation (step T9/YES), the second control unit **250** changes the display of the touch panel **230** in accordance with the received touch operation (step T13) and returns to the determination of step T11.

[0097] In addition, when the received touch operation is not an input operation (step T12/NO), the second control unit **250** determines whether the received touch operation is an operation on the confirm button (step T14).

[0098] When the received touch operation is an operation on the confirm button (step T14/YES), the second control unit **250** determines whether at least one of the IP address and the password has been changed (step T15).

[0099] When at least one of the IP address and the password has been changed (step T15/YES), the second control unit **250** sends a change request to the printing apparatus **100** (step T16). This change request includes at least one of the changed password and IP address. In addition, the change request includes a printing instruction in the case where the setting of the first setting column **310** is “print”. When the second control unit **250** sends the change request to the printing apparatus **100**, it terminates the display of the APP screen **300** displayed on the touch panel **230** (step T17) and displays other information. For example, the second control unit **250** displays information about the printing apparatus **100**.

[0100] When the IP address and the password have not been changed (step T15/NO), the second control unit **250** terminates the display of the APP screen **300** (step T17) and displays other information. For example, the second control unit **250** displays information about the printing apparatus **100**.

[0101] When the received touch operation is not an operation on the confirm button **350** (step T14/NO), the second control unit **250** determines whether the received touch operation is a termination operation (step T18). When the received touch operation is a termination operation (step T18/YES), the second control unit **250** terminates the display of the APP screen **300** (step T17) and displays other information. In addition, when the received touch operation is not a termination operation (step T18/NO), the second control unit **250** executes a process corresponding

to the received operation (step T19) and returns to the determination of step T11.

5. Other Embodiments

[0102] The embodiments described above are preferred embodiments. However, the embodiments described above are not limitative, and various variations may be implemented within the scope that does not depart from the gist.

[0103] For example, each functional part illustrated in FIG. 1 indicates a functional configuration, and the specific implementation form is not limited. In other words, it is not necessary to implement hardware corresponding to each functional part individually, and it is of course possible to configure a single processor to realize the functions of multiple functional parts by executing a program. In addition, some of the functions realized in software in the above embodiments may be realized in hardware, or some of the functions realized in hardware may be realized in software.

[0104] The processing units in the flowcharts illustrated in FIGS. 3 and 4 are divided according to the main processing contents to facilitate understanding of the processing of the printing apparatus 100 and information processing apparatus 200, and the invention is not limited by the way the processing units are divided or their names. The processing of the printing apparatus 100 and information processing apparatus 200 may be further divided into many processing units according to the content of the processing. The processing of the printing apparatus 100 and the information processing apparatus 200 may be divided so that one processing unit includes even more processing.

[0105] When the method for changing the settings of the printing system is realized using a computer provided by the printing apparatus 100 and the information processing apparatus 200, the program to be executed by this computer can be configured in the form of a recording medium or a transmission medium for transmitting this program. As the recording medium, a magnetic or optical recording medium or a semiconductor memory device can be used. Specifically, portable or fixed recording media such as flexible disks, hard disk drives (HDDs), CD-ROMs, DVDs, Blu-ray Discs, optical magnetic disks, flash memory, and card-type recording media can be used. The above recording media can also be used in servers. The above recording media may also be non-volatile storage devices such as RAM, ROM, HDD, etc., which are internal storage devices provided by the server device. Blu-ray is a registered trademark.

6. Overview of the Present Disclosure

[0106] An overview of the present disclosure is described below.

Supplementary Note 1

[0107] A printing system includes a printing apparatus, and an information processing apparatus, in which the printing apparatus includes a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus includes a second radio communication unit configured to perform P2P communication, a reading unit configured to read the special code, and a second control unit configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

[0108] According to this configuration, when the printing apparatus is activated in a state where a condition set in advance is met, the special code including the address information of the network communication is printed by the printing apparatus. In this manner, the special code that allows for an access to the printing apparatus is printed, and thus the information processing apparatus can

access the printing apparatus with a simple operation, thereby improving user convenience.

[0109] In addition, when the operation screen for receiving a change to the setting of the printing apparatus is displayed and the setting of the printing apparatus is changed on the operation screen, the printing apparatus is instructed with the changed setting of the printing apparatus. In this manner, the setting of the printing apparatus can be changed.

Supplementary Note 2

[0110] The printing system according to Supplementary Note 1, in which the setting of the printing apparatus includes a password, and when an operation of changing the password is received, the second control unit sends a changed password to the printing apparatus.

[0111] According to this configuration, when the password is changed by operating the operation screen, the changed password is sent to the printing apparatus. In this manner, the password of the printing apparatus can be changed.

Supplementary Note 3

[0112] The printing system according to Supplementary Note 2, in which the second control unit sends, to the printing apparatus, the changed password and a printing instruction of the special code, and the first control unit causes the printing unit to print the special code with the printing instruction.

[0113] According to this configuration, when the password is changed by operating the operation screen, the changed password and the printing instruction of the special code are sent to the printing apparatus. In this manner, when the password of the printing apparatus is changed, the special code can be printed by the printing apparatus.

Supplementary Note 4

[0114] The printing system according to Supplementary Note 2, in which the second control unit sends, to the printing apparatus, the changed password and a printing instruction of the password, and the first control unit causes the printing unit to print the password with the printing instruction.

[0115] According to this configuration, when the password is changed by operating the operation screen, the changed password and the printing instruction of the password are sent to the printing apparatus. In this manner, when the password of the printing apparatus is changed, the changed password can be printed by the printing apparatus.

Supplementary Note 5

[0116] The printing system according to Supplementary Note 2, in which the second control unit erases a display of the operation screen after the changed password is sent to the printing apparatus.

[0117] According to this configuration, after the changed password is sent to the printing apparatus, the display of the operation screen is erased. This can set the state of not receiving the operation of changing the setting of the printing apparatus.

Supplementary Note 6

[0118] The printing system according to Supplementary Note 1, in which the setting of the printing apparatus includes the address information, when an operation of changing the address information is received, the second control unit sends changed address information to the printing apparatus, and after the setting of the printing apparatus is changed based on the changed address information, the first control unit does not accept an access based on the special code including the address information before being changed.

[0119] According to this configuration, when the address information of the printing apparatus is changed on the operation screen, the changed address information is sent to the printing apparatus, and, after the setting of the address information is changed, the printing apparatus is set to a state of not receiving accesses based on the special code including the address information before the change. In this manner, accesses to the printing apparatus using the special code including the address information before the change can be prevented, thereby improving the safety.

Supplementary Note 7

[0120] The printing system according to Supplementary Note 6, in which when the operation of

changing the address information is received, the second control unit sends changed address information and a printing instruction of the address information to the printing apparatus, and the first control unit causes the printing unit to print the special code including the address information with the printing instruction.

[0121] According to this configuration, when the address information of the printing apparatus is changed on the operation screen, the changed address information and the printing instruction of the address information are sent to the printing apparatus. In this manner, the special code including the changed address information can be printed by the printing apparatus.

Supplementary Note 8

[0122] The printing system according to Supplementary Note 7, in which the first control unit causes the printing unit to print the special code and a model name of the printing apparatus.

[0123] According to this configuration, the special code and the printing apparatus model name are printed by the printing apparatus. In this manner, the user convenience can be improved.

Supplementary Note 9

[0124] The printing system according to Supplementary Note 7, in which the first control unit causes the printing unit to print the special code and a date.

[0125] According to this configuration, the special code and the date are printed by the printing apparatus. In this manner, the user convenience can be improved.

Supplementary Note 10

[0126] The printing system according to Supplementary Note 7, in which the first control unit causes the printing unit to print the special code, a date and a time.

[0127] According to this configuration, the special code, the date and the time are printed by the printing apparatus. In this manner, the user convenience can be improved.

Supplementary Note 11

[0128] The printing system according to Supplementary Note 1, in which the special code is a QR code that is a registered trademark.

[0129] According to this configuration, a QR code is used as the special code. In this manner, the amount of information included in the special code increases, thereby increasing the safety.

Supplementary Note 12

[0130] The printing system according to Supplementary Note 7, in which the operation screen includes a setting item to enable or disable printing of the special code, and when a setting of the setting item is disabled, the second control unit does not send the printing instruction of the address information to the printing apparatus.

[0131] According to this configuration, the operation screen includes the setting items to enable or disable the printing of the special code, and when the setting item is disabled, the printing instruction of the address information is not sent to the printing apparatus. In this manner, the user can select whether to print the special code including the address information, thereby improving user convenience.

Supplementary Note 13

[0132] A printing apparatus includes a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met.

[0133] According to this configuration, when the printing apparatus is activated in a state where a condition set in advance is met, the special code including the address information of the network communication is printed by the printing apparatus. In this manner, the special code that allows for an access to the printing apparatus is printed, and thus the information processing apparatus can

access the printing apparatus with a simple operation, thereby improving user convenience.

Supplementary Note 14

[0134] An information processing apparatus includes a second radio communication unit configured to perform the P2P communication, a reading unit configured to read the special code, a second control unit configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

[0135] According to this configuration, when the operation screen for receiving a change to the setting of the printing apparatus is displayed and the setting of the printing apparatus is changed on the operation screen, the printing apparatus is instructed with the changed setting of the printing apparatus. In this manner, the setting of the printing apparatus can be changed by reading the special code, thereby improving user convenience.

Supplementary Note 15

[0136] A method of changing a setting of a printing system, the printing system including a printing apparatus and an information processing apparatus, the printing apparatus including a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, and a printing unit configured to print an image on a medium, the information processing apparatus including a second radio communication unit configured to perform the P2P communication, and a reading unit, in which the printing apparatus causes the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus accesses the printing apparatus based on the special code read by the reading unit, causes a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and sends, to the printing apparatus, a changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.

[0137] According to this configuration, when the printing apparatus is activated in a state where a condition set in advance is met, the special code including the address information of the network communication is printed by the printing apparatus. In this manner, the special code that allows for an access to the printing apparatus is printed, and thus the information processing apparatus can access the printing apparatus with a simple operation, thereby improving user convenience.

[0138] In addition, when the operation screen for receiving a change to the setting of the printing apparatus is displayed and the setting of the printing apparatus is changed on the operation screen, the printing apparatus is instructed with the changed setting of the printing apparatus. In this manner, the setting of the printing apparatus can be changed.

Claims

1. A printing system comprising: a printing apparatus; and an information processing apparatus, wherein the printing apparatus includes: a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus, and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus includes: a second radio communication unit configured to perform P2P communication, a reading unit configured to read the special code, and a second control unit

- configured to access the printing apparatus based on the special code read by the reading unit, cause a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and instruct the printing apparatus to implement the changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.
2. The printing system according to claim 1, wherein the setting of the printing apparatus includes a password, and when an operation of changing the password is received, the second control unit sends a changed password to the printing apparatus.
 3. The printing system according to claim 2, wherein the second control unit sends, to the printing apparatus, the changed password and a printing instruction of the special code, and the first control unit causes the printing unit to print the special code with the printing instruction.
 4. The printing system according to claim 2, wherein the second control unit sends, to the printing apparatus, the changed password and a printing instruction of the password, and the first control unit causes the printing unit to print the password with the printing instruction.
 5. The printing system according to claim 2, wherein the second control unit erases a display of the operation screen after the changed password is sent to the printing apparatus.
 6. The printing system according to claim 1, wherein the setting of the printing apparatus includes the address information, when an operation of changing the address information is received, the second control unit sends changed address information to the printing apparatus, and after the setting of the printing apparatus is changed based on the changed address information, the first control unit does not accept an access based on the special code including the address information before being changed.
 7. The printing system according to claim 6, wherein when the operation of changing the address information is received, the second control unit sends changed address information and a printing instruction of the address information to the printing apparatus, and the first control unit causes the printing unit to print the special code including the address information with the printing instruction.
 8. The printing system according to claim 7, wherein the first control unit causes the printing unit to print the special code and a model name of the printing apparatus.
 9. The printing system according to claim 7, wherein the first control unit causes the printing unit to print the special code and a date.
 10. The printing system according to claim 7, wherein the first control unit causes the printing unit to print the special code, a date and a time.
 11. The printing system according to claim 1, wherein the special code is a QR code that is a registered trademark.
 12. The printing system according to claim 7, wherein the operation screen includes a setting item to enable or disable printing of the special code, and when a setting of the setting item is disabled, the second control unit does not send the printing instruction of the address information to the printing apparatus.
 13. A printing apparatus comprising: a first radio communication unit configured to perform Peer-to-Peer communication; a network communication unit configured to perform network communication; a printing unit configured to print an image on a medium, a storage unit configured to store a setting of the printing apparatus; and a first control unit configured to cause the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met.
 14. A method of changing a setting of a printing system, the printing system including a printing apparatus and an information processing apparatus, the printing apparatus including a first radio communication unit configured to perform Peer-to-Peer communication, a network communication unit configured to perform network communication, and a printing unit configured to print an image on a medium, the information processing apparatus including a second radio communication

unit configured to perform the P2P communication, and a reading unit, wherein the printing apparatus causes the printing unit to print a special code including address information for the network communication when the first radio communication unit is in an enabled state and the printing apparatus is activated in a state where a condition set in advance is met, and the information processing apparatus accesses the printing apparatus based on the special code read by the reading unit, causes a display device to display an operation screen for receiving a change to the setting of the printing apparatus, and sends, to the printing apparatus, a changed setting of the printing apparatus when an operation of changing the setting of the printing apparatus is received.
