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IMAGE PROCESSING DEVICE, OUTPUT SYSTEM, AND OUTPUT METHOD

Abstract

An image processing device including: a controller; a device information generator that generates device information including identification information of a device; and a job executor that is capable of executing a job with predetermined setting on the basis of an external command transmitted from a terminal device. The controller displays the generated device information on the terminal device and is capable of outputting the job with predetermined setting by controlling the job executor on the basis of the external command transmitted from the terminal device that has read the displayed device information. The controller determines propriety of display of the device information, according to setting of propriety of external command operation, for a user who is authenticated as an authenticated user in an operation mode that requires user authentication.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation of U.S. patent application Ser. No. 18/669,295, filed on May 20, 2024, which is a continuation of U.S. patent application Ser. No. 18/114,224, filed on Feb. 25, 2023, which claims priority based on JP 2022-034649 filed in Japan on Mar. 7, 2022, the entire contents of the above-identified application are hereby incorporated by reference.

BACKGROUND OF THE INVENTION
Field of the Invention
[0002] The present disclosure relates to an image processing device and the like.
Description of the Background Art
[0003] For example, a multifunction peripheral capable of realizing, in a single apparatus, a plurality of modes, such as a copy mode, a scan mode, and a fax mode, often includes an operation screen for selecting a mode and receiving input and selection of a setting value for the selected mode.
[0004] Recently, it has been a primary trend to adopt, as an operation screen, a touch panel display including a display for displaying various types of information to a user and a touch panel that is disposed on the display in a superimposed manner to detect a position touched by a user's finger. The user can easily and intuitively select a mode or input and select a setting value for the selected mode by operating the touch panel while checking the various types of information displayed on the display.
[0005] It is effective to avoid high frequency contact with unspecified persons in order to reduce a risk of various infectious diseases.
[0006] For example, operation via an operation screen of a shared multifunction peripheral in a workplace, a multipurpose multifunction peripheral installed in a convenience store or the like, is no exception, and there is a need for urgent measures to avoid high frequency contact.
[0007] As an example for avoiding direct contact with the operation screen of a multifunction peripheral or other device, for example, in prior art, a method for creating a document job without manually inputting information into a document processing device such as a multifunction peripheral is known.
[0008] The document processing device according to the prior art at least establishes a communication link with the document processing device and displays encoded data including network interface data for transmitting job identifiers to the document processing device on its own operation panel. Then, a mobile device that acquires the encoded data using various methods establishes a communication link with the document processing device by using this network interface data and causes the document processing device to execute a document job associated with the job identifiers.
[0009] In the prior art, an encoded data display for displaying the encoded data along with a job setting buttons, graphical user interface, and the like is provided on the operation panel such that

acquisition of encoded data by the mobile device is enabled. However, as in the encoded data display according to the prior art, when device information such as encoded data is displayed on the operation panel constantly or each time the job setting button or the like is used, it may be troublesome for a user who does not use the device information, and it is not necessarily excellent in terms of operability.

[0010] An object of the present disclosure is to provide an excellent operable image processing device or the like which achieves reduction of trouble according to display of device information by determining propriety of display of device information on the basis of setting applied to each user.

SUMMARY OF THE INVENTION

[0011] In order to solve the above problem, an image processing device according to the present disclosure includes: a controller; a device information generator that generates device information including identification information of a device; and a job executor that is capable of executing a job with predetermined setting on the basis of an external command transmitted from a terminal device, wherein the controller displays the generated device information on the terminal device, and is capable of outputting the job with predetermined setting by controlling the job executor on the basis of the external command transmitted from the terminal device that has read the displayed device information, and the controller determines propriety of display of the device information according to setting of propriety of external command operation for a user who is authenticated as an authenticated user in an operation mode requiring user authentication.

[0012] In addition, an image processing device according to the present disclosure includes: a controller; a device information generator that generates device information including identification information of a device; and a job executor that is capable of executing a job with predetermined setting on the basis of an external command transmitted from a terminal device, wherein the controller displays the generated device information on the terminal device, and is capable of outputting the job with predetermined setting by controlling the job executor on the basis of the external command transmitted from the terminal device that has read the displayed device information, the controller determines propriety of display of the device information on the basis of user information set for each user in an operation mode requiring user authentication, and the user information includes information related to operation authority to the image processing device.

[0013] Furthermore, an image processing device according to the present disclosure includes: a controller; a device information generator that generates device information including identification information of a device; and a job executor that is capable of executing a job with predetermined setting on the basis of an external command transmitted from a terminal device, wherein the controller displays the generated device information on the terminal device, and is capable of outputting the job with predetermined setting by controlling the job executor on the basis of the external command transmitted from the terminal device that has read the displayed device information, the controller determines propriety of display of the device information on the basis of user information set for each user in an operation mode requiring user authentication, and the user information includes information for determining propriety of display of the device information acquired from the terminal device.

[0014] An output system according to the present disclosure is an output system including: a terminal device; and an image processing device, wherein the terminal device includes: a controller; a device information acquirer that acquires device information including identification information for identifying the image processing device, the controller generates a user interface that receives operation setting of the image processing device on the basis of a request by a user, and transmits, as a command, the operation setting received via the user interface, the image processing device includes: a controller; a device information generator that generates the device information including the identification information of a device; and a job executor that is capable of executing a job with predetermined setting on the basis of the command, the controller displays

the generated device information on the terminal device, and is capable of outputting the job with predetermined setting by controlling the job executor on the basis of the command transmitted from the terminal device that has read the displayed device information, and the controller determines propriety of display of the device information according to an authentication result of a user in an operation mode requiring user authentication.

[0015] An output method according to the present disclosure includes: generating device information including identification information of a device; displaying the generated device information on the terminal device, and being capable of outputting the job with predetermined setting on the basis of an external command transmitted from the terminal device that has read the displayed device information; and determining propriety of display of the device information according to an authentication result of a user in an operation mode requiring user authentication.

[0016] According to the present disclosure, it is possible to provide an excellent operable image processing device or the like which achieves reduction of trouble according to display of device information by determining propriety of display of device information on the basis of setting applied to each user.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. **1** is a diagram schematically illustrating an overall configuration of an output system according to a first embodiment.

[0018] FIG. **2** is a diagram illustrating a functional configuration of a multifunction peripheral according to the first embodiment.

[0019] FIG. **3** is a table illustrating a configuration example of device information.

[0020] FIG. **4** is a diagram illustrating a functional configuration of a terminal device according to the first embodiment.

[0021] FIG. **5**A is a diagram illustrating a configuration example of setting information. FIG. **5**B is a diagram illustrating a configuration example of authentication information.

[0022] FIG. **6** is a flowchart illustrating an overall process according to the first embodiment.

[0023] FIG. **7** is a flowchart illustrating a process of the multifunction peripheral according to the first embodiment.

[0024] FIG. **8** is a flowchart illustrating a process of the multifunction peripheral according to the first embodiment.

[0025] FIG. **9**A is a diagram illustrating a data configuration example of an authentication information table. FIG. **9**B is a diagram illustrating a data configuration example of a command reception setting table. FIG. **9**C is a diagram illustrating a data configuration example of a port use setting table. FIG. **9**D is a diagram illustrating a data configuration example of user information table.

[0026] FIG. **10** is a flowchart illustrating a process of the terminal device according to the first embodiment.

[0027] FIG. **11** is a diagram illustrating an operation example according to the first embodiment.

[0028] FIG. **12** is a diagram illustrating an operation example according to the first embodiment.

[0029] FIG. **13** is a diagram illustrating an operation example according to the first embodiment.

[0030] FIG. **14** is a diagram illustrating an operation example according to the first embodiment.

[0031] FIG. **15** is a diagram illustrating an operation example according to the first embodiment.

[0032] FIGS. **16**A and **16**B are a diagram illustrating an operation example according to the first embodiment.

[0033] FIG. **17** is a diagram illustrating an operation example according to the first embodiment.

[0034] FIG. **18** is a diagram illustrating an operation example according to the first embodiment.

[0035] FIG. **19** is a diagram illustrating an operation example according to the first embodiment.
[0036] FIG. **20** is a diagram illustrating an operation example according to the first embodiment.
[0037] FIG. **21** is a flowchart illustrating a process of a multifunction peripheral according to a second embodiment.
[0038] FIG. **22** is a diagram illustrating a data configuration example of a user information table.
[0039] FIGS. **23**A to **23**C are a diagram illustrating an operation example according to the second embodiment.
[0040] FIG. **24** is a flowchart illustrating a process of a multifunction peripheral according to a third embodiment.
[0041] FIG. **25**A is a diagram illustrating a data configuration example of a user information table.
[0042] FIG. **25**B is a diagram illustrating a data configuration example of display ON/OFF information of device information.
[0043] FIGS. **26**A and **26**B are a diagram illustrating an operation example according to the third embodiment.
[0044] FIG. **27** is a diagram schematically illustrating an overall configuration of an output system according to a fourth embodiment.
[0045] FIG. **28** is a diagram illustrating a functional configuration of network service according to the fourth embodiment.
[0046] FIG. **29** is a diagram illustrating a data configuration example of a job stored in the job storage area.
[0047] FIG. **30** is a flowchart illustrating an overall process according to the fourth embodiment.
[0048] FIG. **31** is a flowchart illustrating a process of the network service according to the fourth embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0049] Embodiments of the present disclosure will be described hereinafter with reference to the accompanying drawings. In the present disclosure, a multifunction peripheral **10** capable of executing jobs associated with a copy mode, a scan mode, a fax mode, and the like will be described as an example of an image processing device. The following embodiments are examples for describing the present disclosure, and the technical scope of the description in the claims is not limited to the following description.

1 First Embodiment

[0050] FIG. **1** is a diagram schematically illustrating an overall configuration of an output system **100** according to a first embodiment. The output system **100** includes a multifunction peripheral **10** serving as an image processing device and a terminal device **30**. In the output system **100** according to the first embodiment, an external authentication server that authenticates a user to the multifunction peripheral **10** can be separately provided.

1.1 Functional Configuration

1.1.1 Multifunction Peripheral **10**

[0051] FIG. **2** is a diagram illustrating a functional configuration of the multifunction peripheral **10**. The multifunction peripheral **10** includes a controller **11**, a display **13**, an operation inputter **15**, an outputter **17**, a communicator **19**, a short-range wireless communicator **21**, and a storage **23**.
[0052] The controller **11** controls the overall multifunction peripheral **10**. The controller **11** is composed of, for example, one or more arithmetic devices (such as a central processing units (CPUs).). The controller **11** reads and executes various programs stored in the storage **23**, so that functions thereof is implemented.
[0053] The display **13** displays various types of information to a user or the like. The display **13** may be configured from, for example, a liquid crystal display (LCD) or an organic electro-luminescence (EL) display. The display **13** displays device information as described below.
[0054] The operation inputter **15** receives input of information performed by the user or the like. The operation inputter **15** can be composed of a hardware key (for example, a numeric keypad), a

button, and the like The operation inputter **15** may be configured as a touch panel display that allows input via the display **13**. In this case, examples of a method of input to the touch panel display may include a resistive method, an infrared method, an inductive method, and a capacitive method.

[0055] The outputter **17** includes an image former **171** and an image reader **173**. The image former **171** forms and outputs an image based on image data (scan data generated by scanning a printed document or electronic data input from an external device, a portable storage medium, or other external source) on paper as a recording medium. The image former **171** may include, for example, a laser printer using an electrophotographic system. In this case, the image former **171** forms an image by using toners supplied from toner cartridges (not illustrated) corresponding to toner colors (e.g., cyan, magenta, yellow, and black).

[0056] The image reader **173** generates scan data by scanning the printed document to be read and outputs electronic data in a predetermined format format (e.g., PDF (portable document format)) on the basis of the scan data. The image reader **173** may be configured as a scanner device including an image sensor such as a charge coupled device (CCD) and a contact image sensor (CIS). The image reader **173** is not limited in its configuration as long as the image reader **173** can output scan data (electronic data) by reading a reflected light image from the printed document with an image sensor.

[0057] The communicator **19** includes either or both wired and wireless interfaces for communication with other device via a LAN (Local area network), a WAN (Wide area network), the Internet, a telephone line, a fax line, or the like, for example.

[0058] The short-range wireless communicator **21** communicates with other device such as the terminal device **30** via a short-range wireless communication protocol such as Wi-Fi (registered trademark), Bluetooth®, infrared, Near field communication (NFC), and RFID (Radio frequency identification), and acquires authentication information, an external command, or the like, described below. In a case where the authentication information is obtained from an IC (Integrated circuit) card or an ID (Identity/Identification Card) card such as a magnetic card, a card reader capable of obtaining such card information can be included in the short-range wireless communicator **21**. Some of the functions of the short-range wireless communicator **21** can be performed by the communicator **19**.

[0059] The storage **23** stores various types of data and various programs required for operation of the multifunction peripheral **10**.

[0060] The storage **23** may be formed of, for example, a storage device such as a random access memory (RAM), a hard disk drive (HDD), a solid state drive (SSD), and a read only memory (ROM).

[0061] In the first embodiment, the storage **23** stores an outputter control program **231**, a display processing program **232**, a cooperation application program **233**, a user authentication program **234**, a device information generation program **235**, and a device information display propriety determination program **236**, and ensures a device setting value storage area **237**, and a user information storage area **238**.

[0062] The outputter control program **231** is a program that is read by the controller **11** when the outputter **17** is controlled. The controller **11** that has read the outputter control program **231** controls the outputter **17** and executes a job by printing output by the image former **171** and electronic data output by the image reader **173**.

[0063] The display processing program **232** is, for example, a program read by the controller **11** when display of a home screen (described below) and a setting screen based on each operation mode on the display **13** is controlled. The controller **11** that has read the display processing program **232** displays a display screen including device information on the display **13** at any timing of device startup, sleep mode recovery, auto clear, or user authentication when authentication mode is enabled. The auto clear in the present disclosure is a process that is executed when the job itself

is cancelled or when the input or selection of a setting value pertaining to job execution is cancelled. Generally, auto clear can be executed by selection of an “auto clear button” provided on the display screen. The controller **11** that has read the display processing program **232** restricts display of device information on the display screen in a case where setting applied to an authenticated user meets a predetermined condition. The control of the display of the device information on the display screen will be described below.

[0064] The cooperation application program **233** is a program that is read by the controller **11** when cooperation with the terminal device **30** is started. The controller **11** reads the cooperation application program **233** to receive a command including setting information and the like (hereinafter sometimes referred to as an external command) transmitted from the terminal device **30**.

[0065] Herein, the “cooperation” denotes that at least two devices work together while sharing information in order to obtain a single result. In the first embodiment, the setting information pertaining to job execution set by the terminal device **30** is transmitted as the external command to the multifunction peripheral **10**. The multifunction peripheral **10** can share setting information pertaining to job execution with the terminal device **30** by acquiring the setting information.

[0066] In order for the multifunction peripheral **10** and the terminal device **30** to cooperate, connection must be established between the multifunction peripheral **10** and the terminal device **30** to communicate in both directions. The connection established between the multifunction peripheral **10** and the terminal device **30** may be limited to connection only during operation of the cooperation application program **233**, or may be always maintained while the devices are in operation. Furthermore, the connection may be established only when necessary communication is performed.

[0067] The user authentication program **234** is a program that is read by the controller **11** when a user who logs into the multifunction peripheral **10** is authenticated. In a case where the authentication function is on, the controller **11** that has read the user authentication program **234** authenticates the user who logs into the device on the basis of the authentication information received for input via a login screen described below. In addition to knowledge authentication such as combination of a login user name and a login password of a user attempting to log in to the device, the user authentication can also be performed by biometric authentication using the terminal device **30** such as a cell phone, a smart phone, and a tablet, possession authentication using an ID card such as an IC card and a magnetic card, face recognition, and fingerprint recognition.

[0068] The device information generation program **235** is a program read by the controller **11** when the device information including the identification information of the multifunction peripheral **10** is generated. The device information pertaining to the present disclosure includes, at least, items related to the setting of the multifunction peripheral **10** required for inputting setting information at the terminal device **30**, as well as items related to the connection such as identification information of the multifunction perpheral **10** and session keys. The controller **11** that has read the device information generation program **235** generates this information as encoded information and characters (such as numbers, English letters, kana, hiragana, kanji, symbols). Examples of the encoded information include a one-dimensional code such as a bar code (e.g., an EAN code, a JAN code, Codbar, CODE **128**), or a two-dimensional code. Examples of the two-dimensional code include a stacked two-dimensional code (e.g., PDF 417 or CODE **49**), or a matrix two-dimensional code (e.g., a quick response code (QR Code (registered trademark)), Data Matrix, Veri Code, or Aztec). In the following description, a quick response code (QR code®).) is used as an example of the device information.

[0069] The controller **11** updates the device information on a regular or irregular basis. For example, the controller **11** may update a driver program for the multifunction peripheral **10**, and updates the device information in order to correspond to an added new function. For example, the

device information may also be updated when information related to connection such as a network address (IP address) or the like is updated or changed with change in the device installation location.

[0070] Herein, a configuration example of the device information will be described with reference to FIG. **3**. The device information illustrated in FIG. **3** includes “name”, “type”, and “version” as interface (I/F)-related item, “color mode”, “transmission destination”, “setting of reading”, “image orientation”, and the like as multifunction peripheral-related item, and “device ID”, “session key”, “installation country”, and the like as connection-related item, all items of which are described in specific formats. The terminal device **30** may read and decode the encoded device information to acquire the device information of the multifunction peripheral **10**. The terminal device **30** can be connected to the multifunction peripheral **10** on the basis of the acquired device information.

[0071] The device information items and the values thereof illustrated in FIG. **3** are only examples, and the device information according to the present disclosure is not limited to the illustration in FIG. **3**. For example, a personal identification number (PIN) or a one-time password generated by a token may be included in the device information to establish secure connection.

[0072] The device information display propriety determination program **236** is a program read by the controller **11** when whether or not the device information should be displayed on the display screen is determined. The controller **11** that has read the device information display propriety determination program **236** determines the display propriety of the device information in accordance with the setting for the authenticated user. The determination as to the display propriety of the device information will be described later.

[0073] The device setting value storage area **237** is a storage area where device setting values pertaining to generation of the device information are stored. The controller **11** that has read the device information generation program **235** generates the device information by reading the device setting values (e.g., setting values related to “color mode”, “transmission destination”, “read setting”, “image orientation”, and the like) stored in the device setting value storage area **237**.

[0074] The user information storage area **238** is a storage area where authentication information for user authentication and a table related to setting applied to authenticated users (e.g., user information, a command reception setting table, and the like, as described below) are stored. For example, in a form in which the user authentication is performed by inputting the combination of a login user name and a login password on a login screen, the user information storage area **238** stores the combination of the login user name and the login password of the login user to be authenticated as the authenticated user. The table stored by the user information storage area **238** is information in which the controller **11** refers to when the display propriety of the device information is determined, and is, for example, information in which ON/OFF of the display of the device information is set for each authenticated user.

1.1.2 Terminal Device **30**

[0075] The terminal device **30** according to the present disclosure may be configured as, for example, a mobile terminal device such as a smartphone, a tablet, a cell phone, and a notebook computer. The terminal device **30** is configured as a device that has combination of at least a function of providing a (graphical) user interface, a communication function, and a function unique to a mobile terminal device.

[0076] FIG. **4** is a functional configuration diagram of the terminal device **30**. The terminal device **30** includes a controller **31**, a display **33**, an operation inputter **35**, a communicator **37**, a short-range wireless communicator **39**, an imager/scanner **41**, and a storage **43**.

[0077] The controller **31** controls the overall terminal device **30**. The controller **31** is composed of, for example, one or more arithmetic devices (such as CPUs), and the controller **31** reads and executes various programs stored in the storage **43** to perform functions thereof.

[0078] The display **33** displays various types of information to a user or the like. The display **33** may be constituted by, for example, an LCD, an organic EL display or the like. The display **33** can

display, for example, an application screen as a reception screen for receiving job setting on the basis of display control by the controller **11** that has read a cooperation application program **431**.
[0079] The operation inputter **35** receives input of information performed by the user or the like. The operation inputter **35** may be configured as a touch panel display that enables input via the display **33**. In this case, examples of a method of input to the touch panel display may include a resistive method, an infrared method, an inductive method, and a capacitive method.
[0080] The communicator **37** includes either or both wired and wireless interfaces for communication with other device via a LAN, a WAN, the Internet, a telephone line, or the like.
[0081] As long as the short-range wireless communicator **39** can use short-range wireless communication protocols such as Wi-Fi®, Bluetooth (registered trademark), infrared, NFC, RFID, or the like, for example, and can transmit authentication information, a command, or the like by communicating with other devices such as the multifunction peripheral **10**, there are no restrictions on the configuration of the short-range wireless communicator **39**. Some of the functions of the short-range wireless communicator **39** can be performed by the communicator **37**.
[0082] Examples of the imager/scanner **41** include an imaging device such as a camera, and a scanning device using a laser beam. In a case where the multifunction peripheral **10** displays device information on the basis of control by the controller **31** that has read a device information acquisition program **433**, the imager/scanner **41** acquires the device information. There are no restrictions on the configuration of the imager/scanner **41** as long as the imager/scanner is capable of acquiring the device information for the multifunction peripheral **10**. In a case where the configuration is a configuration of providing device information in the form of electronic data, the device information can also be acquired via the short-range wireless communicator **39**.
[0083] The storage **43** stores various programs and various types of data required for operation of the terminal device **30**. The storage **43** may be composed of a storage device such as a RAM, an HDD, an SSD, and a ROM.
[0084] In the first embodiment, the storage **43** stores the cooperation application program **431**, the device information acquisition program **433**, and an authentication information transmission program **435**, and ensures an authentication information storage area **437**, and a setting value storage area **439**.
[0085] The cooperation application program **431** is a program that is read by the controller **31** when cooperation with the multifunction peripheral **10** is started. The controller **31** can generate an application screen that receives setting for a job to be executed by the multifunction peripheral **10** and output an instruction to execute a job to the multifunction peripheral **10** by reading the cooperation application program **431**.
[0086] The controller **31** that has read the cooperation application program **431** generates setting information used for job execution on the basis of various setting values inputted and selected via the generated application screen. Then, the controller **31** transmits the generated setting information as an external command to the multifunction peripheral **10** by using the necessary connection information included in the device information acquired from the multifunction peripheral **10**.
[0087] Herein, FIG. **5**A is a diagram illustrating a configuration example of the setting information to be transmitted as the external command by the controller **31**. FIG. **5**A illustrates setting items including a group of “mode”, “transmission destination”, “reading setting”, “image orientation”, “color mode” that are inputted and selected via the application screen or other means, as a configuration example of the setting information. The controller **31** transmits these setting information as the external command to the multifunction peripheral **10** on the basis of the device ID: “jv6Ou3QBGv8w6yNtGt”, session key: “lqazxsw23edcvfr45tgbnhy67ujm,ki8----” and other connection information acquired from the device information of the multifunction peripheral **10**.
[0088] The device information acquisition program **433** is a program read by the controller **31** when the device information is acquired from the multifunction peripheral **10**. The controller **31** that has read the device information acquisition program **433** acquires the device information from

the multifunction peripheral **10** by controlling the imager/operation acceptor **41** and the short-range wireless communicator **39**.

[0089] The authentication information transmission program **435** is a program that is read by the controller **31** when a user logs into the multifunction peripheral **10** via the terminal device **30**. When a user who uses the terminal device **30** attempts to log in to the multifunction peripheral **10** without going through the login screen provided by the multifunction peripheral **10**, for example, the controller **31** that has read the authentication information transmission program **435** transmits the authentication information illustrated in FIG. **5**B to the multifunction peripheral **10**. FIG. **5**B is an example that includes user ID "0001", password "*****", and user name "Ai Ueo" as authentication information. The authentication information can be transmitted via the short-range wireless communicator **39** or the communicator **37**.

[0090] The authentication information storage area **437** is a storage area where the authentication information to be transmitted to the multifunction peripheral **10** is stored.

[0091] The setting value storage area **439** is a storage area where a setting value pertaining to execution of a job is stored. The setting value stored in the setting value storage area **439** may be read out as appropriate when the controller **31** generates the setting information.

1.2 Flow of Process

1.2.1 Overall Process

[0092] Now, an overall process according to the first embodiment will be described with reference to a flowchart in FIG. **6**.

[0093] First, the multifunction peripheral **10** starts cooperation application on the basis of an activation instruction issued by a user (Step S**10**). The cooperation application of the multifunction peripheral **10** is not limited to input of a startup instruction by the user, but can also be automatically started, for example, at the time of device startup, recovery from a sleep mode, or auto-clear.

[0094] The user inputs a startup instruction of the cooperation application by operating the terminal device **30** (Step S**12**).

[0095] For example, in a case where user authentication is required in the operation of the cooperation application in the multifunction peripheral **10**, the terminal device **30** transmits authentication information to the multifunction peripheral **10** (Step S**14**).

[0096] When the authentication information is received, the multifunction peripheral **10** performs the user authentication to a device information display propriety determination process (Step S**16**). Details of the process pertaining to Step S**16** will be described below.

[0097] In a case where the user authentication is successful and the display of device information is enabled, the multifunction peripheral **10** displays the device information (Step S**18**). Then, the multifunction peripheral **10** transmits, to the terminal device **30**, a response signal indicating that the user authentication is successful (Step S**20**).

[0098] Upon receipt of the response signal from the multifunction peripheral **10**, the terminal device **30** starts the cooperation application (Step S**22**).

[0099] The user inputs various setting values required to execute a job via the application screen provided by the cooperation application of the terminal device **30** (Step S**24**).

[0100] The terminal device **30** receives the various input setting values and stores the received setting values in the setting value storage area **439** (Step S**26**).

[0101] Next, when the user selects a start button as job execution instruction input (Step S**28**), the terminal device **30** acquires the device information from the multifunction peripheral **10** (Step S**30**).

[0102] The terminal device **30** generates setting information on the basis of the stored various setting values. Then, the terminal device **30** transmits the generated setting information as an external command to the multifunction peripheral **10**, using necessary connection information included in the device information acquired from the multifunction peripheral **10** (Step S**32**). In

addition to the setting information pertaining to the job execution, the external command to be transmitted to the multifunction peripheral **10** may include other information such as an execution instruction command for job, an instruction, and the like.

[0103] The multifunction peripheral **10** then executes the job on the basis of the received external command (Step S**34**).

1.2.2 Process of Multifunction Peripheral **10**

[0104] Now, a process of the multifunction peripheral **10** will be described with reference to a flowchart in FIG. **7**. First, the controller **11** of the multifunction peripheral **10** determines whether or not the device state is device startup or recovery from a sleep mode (Step S**100**).

[0105] In a case where the controller **11** determines that the device state is the device startup or the recovery from the sleep mode, the controller **11** starts a device startup process. Specifically, the controller **11** reads the cooperation application program **233** and starts the cooperation application (Yes in Step S**100**.fwdarw.Step S**110**).

[0106] On the other hand, in a case where the controller **11** determines that the device state is not the device startup or the recovery from the sleep mode, the controller **11** determines whether or not the device state is input of auto clear (No in Step S**100**.fwdarw.Step S**120**).

[0107] In a case where the controller **11** determines that the device state is the input of auto clear, the controller **11** shifts the process to Step S**130** (Yes in Step S**120**.fwdarw.Step S**130**). On the other hand, in a case where the controller **11** determines that the device state is not the input of auto clear, the controller **11** shifts the process to Step S**210** (No in Step S**120**.fwdarw.Step S**210**).

[0108] Next, the controller **11** performs user authentication to device information display propriety determination (Step S**130**). The user authentication to the device information display propriety determination in Step S**130** will be described with the next figure.

[0109] When the user authentication to the device information display propriety determination are terminated, the controller **11** determines whether or not, for example, a driver program, a session key, or other information related to the connection is updated (Step S**140**). In a case where there are the updated information and the like, the controller **11** reads the device information generation program **235**, and updates the device information on the basis of the updated information (Yes in Step S**140**.fwdarw.Step S**150**).

[0110] Then, the controller **11** displays a display screen including the device information updated in Step S**150** on the display **13** (Step S**160**).

[0111] On the other hand, in a case where there are no updated information and the like, the controller **11** does not update the device information, and displays this device information on the display **13** (No in Step S**140**.fwdarw.Step S**160**).

[0112] Next, the controller **11** determines whether or not a “close button” provided on the display screen including the device information is selected (Step S**170**). In a case where the “close button” is not selected, the controller **11** issues a request for acquiring a job (No in Step S**170**.fwdarw.Step S**180**).

[0113] Then, the controller **11** determines whether or not a job is acquired (Step S**180**). When it is determined that the job is acquired from the terminal device **30**, the controller **11** executes the acquired job and terminates the process (Yes in Step S**190**.fwdarw.Step S**200**). When it is determined that the job is not acquired from the terminal device **30**, the controller **11** returns the process to Step S**170** (No in Step S**190**.fwdarw.Step S**170**).

[0114] In a case where the “close button” is selected, the controller **11** displays a home screen (Yes in Step S**170**.fwdarw.Step S**210**). In this case, the controller **11** does not output the job acquired from the terminal device **30**.

[0115] Then, the controller **11** determines whether or not a job execution instruction is received via the home screen (Step S**220**). In a case where it is determined that the job execution instruction is input by the user via the home screen, the controller **11** executes the job and terminates the process (Yes in Step S**220**.fwdarw.Step S**200**). In a case where the job execution instruction is not input, the

controller **11** continues to display the home screen (No in Step S**220**.fwdarw.Step S**210**).
[0116] Next, the user authentication to the device information display propriety determination in Step S**130** in FIG. **7** will be described with reference to FIG. **8** and FIG. **9**. The controller **11** reads the user authentication program **234**, the device information display propriety determination program **236**, and the like, so that the process described herein can be executed.
[0117] FIG. **8** is a flowchart illustrating the user authentication to device information display propriety determination. First, the controller **11** determines whether the authentication mode for user authentication is enabled (ON). The authentication mode can be enabled/disabled, for example, by an administrator user with administrative authority via the settings screen or the like described below.
[0118] In a case where the authentication mode is enabled and, for example, an authentication process is performed on the basis of the authentication information input via the login screen, the controller **11** displays the login screen (authentication screen) on the display **13** (Step S**310**).
[0119] The controller **11** then receives input of a login user name and a login password as the authentication information via the login screen (Step S**320**). The controller **11** stores the login user name and the login password in association with each other, and performs the user authentication by checking the login user name and the login password, the input of which is received in Step S**320**.
[0120] Herein, FIG. **9**A is a diagram illustrating a data configuration example of an authentication information table stored in the user information storage area **238**. The authentication information table includes, for example, “ID”, (login) “password”, and (login) “user name” to uniquely identify a user. The controller **11** can perform the user authentication by checking the authentication information table for the combination of the login user name and the login password received via the login screen.
[0121] In a case where the user authentication is successful as a result of checking the login user name and the login password, the controller **11** refers to external command reception setting (Yes in Step S**330**.fwdarw.Step S**340**). The login user successfully authenticated is referred to as an authenticated user. On the other hand, in a case where the user authentication is not successful, the controller **11** returns the process to Step S**320** (No in Step S**330**.fwdarw.Step S**320**).
[0122] Herein, the external command reception setting referenced by the controller **11** will be described. FIG. **9**B is a diagram illustrating a data configuration example of the command reception setting table according to the first embodiment.
[0123] The command reception setting table illustrated in FIG. **9**B includes “ID”, “password”, “user name”, and “command reception YES/No”. The “ID”, the “password”, and the “username” are the same items included in the authentication information table illustrated in FIG. **9**A. The “command reception YES/No” is an item that indicates whether or not an external command can be received by each authenticated user as YES or No. For example, for the authenticated user with “user name Ai Ueo” pertaining to “ID 0001”, the “command reception YES/No” is set to “YES”. In this case, in a case where the user with “user name Ai Ueo” is logged into the multifunction peripheral **10** as the authenticated user, the controller **11** receives the external command transmitted from the terminal device **30**. On the other hand, in a case where the user with “user name Tachi Tsuteto” is logged into the multifunction peripheral **10** as the authenticated user, the controller **11** does not receive the external command transmitted from the terminal device **30**.
[0124] In a case where as the result of the reference to the external command reception setting, the setting of the external command reception for the authenticated user is “YES”, the controller **11** refers to the port use setting (Yes in Step S**350**.fwdarw.Step S**360**).
[0125] Herein, the port use setting according to the first embodiment is to set the availability of a port (port number) for identifying services (application processes and threads) on TCP/UDP. FIG. **9**C is a diagram illustrating a data configuration example of the port use setting table according to the first embodiment.

[0126] The port use setting table illustrated in FIG. **9**C includes “ID”, “password”, “user name”, and “port port No./NO”. The “ID”, the “password”, and the “username” are the same items included in the authentication information table illustrated in FIG. **9**A. The “port port No./NO” is an item indicating the availability of the port number for each authenticated user as port No. or “NO” indicating that the port is not available. For example, for the authenticated user with “user name Ai Ueo” pertaining to “ID 0001”, the “port port No./NO” is set to “port No. 1”. In this case, in a case where the user with “user name Ai Ueo” is logged in to the multifunction peripheral **10** as the authenticated user, the controller **11** permits the use of port No. 1. On the other hand, in a case where the user with “user name Tachi Tsuteto” is logged into the multifunction peripheral **10** as the authenticated user, the controller **11** disables the use of the port because the “port port No./NO” is set to “NO”.

[0127] In the illustration in FIG. **9**C, the port No. is illustrated as fictitious port No. such as “port No. 1” and “port No. 3”, for example, to facilitate understanding. However, it is also acceptable to use a specific system port (well-known port) number such as “port No. 80 (https)”, “port No. 443 (https)” and “port No. 21 (ftp)”, other registered port numbers, a private number, or the like. It is also possible to set the availability of a protocol such as “http” “https”, “smtp”, and “pop”, for each authenticated user in addition to or separately from port No.

[0128] In a case where, as a result of the reference to the port use setting, the port use setting for the authenticated user is acceptable (OK), the controller **11** refers to user information table (Yes in Step S**370**.fwdarw.Step S**380**).

[0129] Herein, the user information according to the present disclosure is the setting to turn on/off the display of the device information for each authenticated user. For example, FIG. **9**D is a diagram illustrating a data configuration example of the user information table according to the first embodiment.

[0130] The user information table illustrated in FIG. **9**D includes “ID”, “password”, “user name”, and “device information ON/OFF”. The “ID”, the “password”, and the “username” are the same items included in the authentication information table illustrated in FIG. **9**A. The “device information ON/OFF” is an item that represents the display or non-display of the device information for each authenticated user as “ON/OFF”. For example, for the authenticated user with “user name Ai Ueo” pertaining to “ID 0001”, the “device information ON/OFF” is set to “ON”. In this case, in a case where the user with “user name Ai Ueo” is logged into the multifunction peripheral **10** as the authenticated user, the controller **11** displays the device information. On the other hand, in a case where the user with “user name Tachi Tsuteto” is logged into the multifunction peripheral **10** as the authenticated user, the controller **11** does not display the device information because the “device information ON/OFF” is set to “OFF”.

[0131] In a case where, as a result of the reference to the user information table, the device information is ON, the controller **11** proceeds to Step S**140** in FIG. **7** (Yes in Step S**390**.fwdarw.Step S**140** in FIG. **7**).

[0132] In a case where the external command reception is “NO” (No in Step S**350**), in a case where the port use is “NO” (Step S**370**; No), or in a case where the device information display is “OFF” (No in Step S**390**), the controller **11** displays the home screen without displaying the device information (Step S**210** in FIG. **7**) and executes Step S**220** and subsequent processes.

1.2.3 Process of Terminal Device **30**

[0133] Now, a flow of the process of the terminal device **30** will be described with reference to the flowchart in FIG. **10**. The controller **31** of the terminal device **30** determines whether or not the user receives an instruction to start the cooperation application program **431** (Step S**500**).

[0134] In a case where the controller **31** determines that the user receives the instruction to start the cooperation application program **431**, the controller **31** transmits the authentication information to the multifunction peripheral **10** (Yes in Step S**500**.fwdarw.Step S**510**).

[0135] The controller **31** then determines whether or not a response signal indicating that the

authentication is successful is received from the multifunction peripheral **10** (Step S**520**). When it is determined that the response signal is received, the controller **31** displays the application screen as a user interface on the display **33** by reading the cooperation application program **431** (Step S**530**). When it is determined that no response signal is received, the controller **31** waits until the response signal is received (No in Step S**520**).

[0136] Subsequently, the controller **31** determines whether or not the user selects a copy job via the application screen (Step S**540**). When it is determined that the user selects the copy job, the controller **31** displays a copy job execution screen on the display **33** (Yes in Step S**540**.fwdarw.Step S**550**).

[0137] The controller **31** receives input of a setting value via the copy job execution screen displayed in Step S**550** (Step S**560**). Then, the controller **31** stores the received setting value in the setting value storage area **439** (Step S**570**).

[0138] The controller **31** determines whether or not the user selects the "start button" (Step S**580**). In a case where it is determined that the "start button" is selected by the user, the controller **31** acquires the device information from the multifunction peripheral **10** (Yes in Step S**580**.fwdarw.Step S**590**). That is, after the selection of the start key, the controller **31** reads the device information acquisition program **433** and acquires the device information displayed on the display **13** of the multifunction peripheral **10**.

[0139] Next, the controller **31** generates setting information from the various setting values stored in the setting value storage area **439**, transmits the setting information by using the necessary connection information included in the device information acquired in Step S**590** (Step S**600**), and terminates the process.

[0140] In a case where it is determined in Step S**540** that the copy job is not selected by the user, the controller **31** determines whether or not a scan job is selected (No in Step S**540**.fwdarw.Step S**610**). In a case where it is determined that the scan job is selected, the controller **31** displays the scan job execution screen on the display **33** (Yes in Step S**610**.fwdarw.Step S**620**). After the scan job execution screen is displayed on the display **33**, the controller **31** executes Step S**560** and subsequent processes.

[0141] In a case where it is determined in Step S**610** that no scan job is selected by the user, the controller **31** determines whether or not any other job (e.g., a fax job) is selected (No in Step S**610**.fwdarw.Step S**630**). In a case where it is determined that other job is selected, the controller **31** displays the job execution screen for the other job (Yes in Step S**630**.fwdarw.Step S**640**) and executes Step **560** and the subsequent process.

1.3 Operation Example

[0142] Now, an operation example according to the first embodiment will be described. FIG. **11** is a diagram illustrating a configuration example of a login screen W**10** displayed on the display **13** when the controller **11** of the multifunction peripheral **10** reads the user authentication program **234**. This operation example corresponds to the process in Step S**310** of FIG. **8**.

[0143] The login screen W**10** includes a login user name input box Bx**10**, a login password input box Bx**12**, a login button B**10**, and a cancel button B**22**.

[0144] The login user name input box Bx**10** is a box that receives input of a login user name of a user who attempts to log into the multifunction peripheral **10**.

[0145] The login password input box Bx**12** is a box that receives input of a login password associated with the login user name of the user who attempts to log into the multifunction peripheral **10**.

[0146] The login button B**10** is a button that receives an instruction to confirm an input content to the login user name input box Bx**10** and the login password input box Bx**12** by the user. The cancel button B**22** is a button that receives input of a cancellation instruction for the authentication process. The user can input an execution instruction for the authentication process by selecting the login button B**10** after inputting the login user name in the login user name input box Bx**10** and

inputting the login password in the login password input box Bx**12**.
[0147] FIG. **12** is a diagram illustrating another mode of the login screen. A login screen W**20** includes a selection button display area R**10** that displays a selection button assigned to each user who attempts to log into the multifunction peripheral **10**.
[0148] The selection button illustrated in the selection button display area R**10** is created as an icons for each user on the basis of the user's authentication information (e.g., the login user name, the e-mail address, and the login password) registered via a user addition/editing screen (not illustrated).
[0149] A user who attempts to log into the multifunction peripheral **10** selects the icon (selection button) representing him or her. The login authentication can then be performed by inputting the login password via a login password input screen (not illustrated) that is displayed by selecting the icon. By selecting the icon representing the user, the login screen W**20** can eliminate the need to input the login user name and perform a login process easily and quickly.
[0150] FIG. **13** is a diagram illustrating a configuration example of a home screen W**30** that is displayed on the display **13** by the controller **11** in Step S**210** of FIG. **7**. The home screen W**30** is a basic screen that receives selection of a job and selection of various function display by the user, for example. The home screen W**30** includes job/function selection buttons B**14**, a display feed button B**16**, a job status button B**18**, and a login user name display area R**12**.
[0151] The job/function selection buttons B**14** receives the selection of the job or function display, or the like, desired by the user. For example, when the user selects a “simple copy” button among the job/function selection buttons B**14**, the controller **11** displays a job execution screen (not illustrated) for setting the “simple copy”. The job/function selection button B**14** in the first embodiment also includes a remote operation button B**20** for enabling a screen transition to a display screen W**40** described with the next figure. When the user selects a remote operation button B**20**, the controller **11** shifts the screen display to the display screen W**40** to enable use of an output method according to the present disclosure. The job/function selection buttons that are not displayed on the screen can be displayed by selecting the display feed button B**16**. The configuration example of the display of the job/function selection buttons B**14** in FIG. **13** is only an example, and the configuration of the job/function selection buttons B**14** is not limited to the illustration in FIG. **13**.
[0152] The job status button B**18** receives an instruction input for notifying a progress status of a job executed by the multifunction peripheral **10**, a reservation status, or the like. When the user selects the job status button B**18**, the controller **11** displays the progress status, the reservation status, and the like of the job which are not illustrated.
[0153] The login user name display area R**12** is a display area where the user name of the authenticated user who is logged into the multifunction peripheral **10** (in the example in FIG. **12**, the authenticated user with the login user name “Ai Ueo”) is displayed.
[0154] FIG. **14** illustrates a configuration example of the display screen W**40** that is displayed on the display **13** by the multifunction peripheral **10**. This operation example corresponds to the process of Step S**160** in FIG. **7**, and the display screen W**40** is displayed at the time of device startup, sleep mode recovery or auto clear, or in a case where the remote operation button B**20** on the home screen W**30** is selected.
[0155] The display screen W**40** includes an operation procedure display area R**14** and a close button B**22**. The operation procedure display area R**14** is an area for describing an operation procedure of the output method according to the first embodiment by an illustration or an animation. In the example illustrated in FIG. **14**, the operation procedure is described in the following order: (1) document set, (2) setting in a terminal device, and (3) job execution.
[0156] The operation procedure display area R**14** includes a device information display area R**16** where the device information of the multifunction peripheral **10** is displayed. In the first embodiment, an example in which a quick response (QR) code is used as encoded information

representing the device information will be described. The QR code® is a two-dimensional code representing data in a graphical form. In addition to the QR code, the information encoded using one or more of a barcode, a symbol, and an alphanumeric character may also be used as the device information. In the first embodiment, the device information displayed in the device information display area R**16** is displayed in a case where the authentication mode according to the user authentication is enabled and the setting for receiving an external command for an authenticated user, port use, and device information display are all enabled.

[0157] The terminal device **30** can execute a job by reading the QR code displayed as the device information in the device information display area R**16** by an imaging device such as a camera or a scanning device using a laser beam.

[0158] The close button B**22** is a button that receives selection when the user desires the execution of the job via the normal home screen without using the output method according to the present disclosure. When the close button B**22** is selected, the controller **11** displays the home screen W**30** on the display **13**.

[0159] FIG. **15** is a diagram illustrating a display configuration example of the device information display area R**16** in a case where the device information display is set to "disabled" (OFF). In a case where the display of the device information is disabled (for example, in a case where the authenticated user is "Kaki Kukeko" and only the display of the device information is "OFF" setting (see FIG. **9**)), a message mentioning that "QR code is restricted. Please operate from a body of the multifunction peripheral." is displayed in the device information display area R**16**. Consequently, the user can know that operation from the body of the multifunction peripheral **10** is required without using the device information. In this case, the user can select the close button B**22** to display the home screen W**30** and then instruct the user to execute the job. In a case where only the display of the device information is set to "disabled (OFF)", control for performing transition to the home screen W**30** without displaying the above message in the device information display area R**16** may be performed.

[0160] FIG. **16**A is a configuration example of an application screen W**50** that is displayed on the display **33** by the controller **31** of the terminal device **30** after receiving a startup instruction of the cooperation application program **431** by the user. This operation example corresponds to the process in Step S**530** of FIG. **10**. The application screen W**50** includes a menu display area R**18** and a favorite list display area R**20**.

[0161] The menu display area R**18** includes a copy job selection button, a scan job selection button B**24**, and a fax job selection button. The copy job selection button receives selection of a copy job by a user. When the copy job selection button is selected, the controller **31** can determine that the copy job is selected by the user. When the copy job selection button is selected, the controller **31** displays a copy job execution screen (not illustrated) on the display **33**.

[0162] The scan job selection button B**24** receives the selection of the scan job by the user. When the scan job selection button B**24** is selected, the controller **31** can determine that a scan job is selected by the user. When the scan job selection button B**24** is selected, the controller **31** displays the scan job execution screen W**50***a* on the display **33**.

[0163] The fax job selection button receives the user's selection of a fax job. When the fax job selection button is selected, the controller **31** can determine that the fax job is selected by the user. When the fax job selection button is selected, the controller **31** displays a fax job execution screen (not illustrated), on the display **33**.

[0164] The favorite list display area R**20** displays items frequently used by the user in a list format. The ascending and descending order display of the favorite list can be switched by a sort button B**26**.

[0165] FIG. **16**B is a diagram illustrating a configuration example of the scan job execution screen W**50***a* displayed by the controller **31** in response to the selection of the scan job selection button B**24** included in the menu display area R**18**. The scan job execution screen W**50***a* includes a setting

value setting area R**22** and a start button B**28**.
[0166] The setting value setting area R**22** is an area where input and selection of destination information and a setting value for scan job execution is received. The setting value setting area R**22** includes setting items associated with the scan job execution such as items “input address” for receiving input and selection of an address serving as destination information, “transmission to own address”, “setting of reading”, “image orientation”, and “color mode”. The user can input and select destination information and setting values for a scan job via the setting value setting area R**22**.
[0167] The start button B**28** is a button that receives input of an instruction to execute a scan job. After completing the input of the destination information and the setting values in the setting value setting area R**22**, the user can select the start button B**28** to transmit the scan job execution instruction to the multifunction peripheral **10**.
[0168] FIG. **17** illustrates a configuration example of a device information acquisition screen displayed by the controller **31** of the terminal device **30** when the start button B**28** of the scan job execution screen W**50***a* is selected and the device information being displayed in the multifunction peripheral **10** is acquired. A device information acquisition screen W**60***a* includes a device information acquisition area R**24** and a status display area R**26**.
[0169] As illustrated in FIG. **17**, the device information acquisition area R**24** may be configured as a guideline that guides the user such that, when the device information to be acquired is encoded information such as a QR code®, the encoded information falls within a reading area of the imaging device or the scanning device. The user operates the terminal device **30** such that the encoded information such as a QR code (registered trademark) falls within the device information acquisition area R**24**.
[0170] The status display area R**26** is an area where an operation or a job progress status (status) to the user is displayed. For example, the status display area R**26** on the device information acquisition screen W**60***a* is an example in which a message indicating that the QR code® is to be read while the QR code® falls within the device information acquisition area R**24** is displayed.
[0171] When the QR code® is read and the device information is acquired, the controller **31** shifts the device information acquisition screen W**60***a* to a device information acquisition screen W**60***b*. On the device information acquisition screen W**60***b*, a message indicating that a job is being transmitted to the multifunction peripheral **10** is displayed in the status display area R**26**.
[0172] After the transmission of the job to the multifunction peripheral **10** is completed, the controller **31** shifts the display screen to a device information acquisition screen W**60***c*. On the device information acquisition screen W**60***c*, a message indicating that the transmission of the job is completed is displayed in the status display area R**26**.
[0173] FIG. **18** is a diagram illustrating a configuration example of an authentication mode setting screen W**70** for receiving setting of enabling/disabling of the authentication mode for the user authentication. The authentication mode setting screen W**70** includes an ON button B**28** for receiving the setting to enable (ON) the authentication mode and an OFF button B**30** for receiving the setting to disable (OFF) the authentication mode.
[0174] The user can enable/disable the authentication mode by selecting either the ON button B**28** or the OFF button B**30**.
[0175] FIG. **19** is a diagram illustrating a configuration example of an external command reception setting screen W**80** that receives setting for receiving or not receiving an external command for each authenticated user. The external command reception setting screen W**80** includes a permission button B**32** that receives setting of allowing (YES) the reception of an external command and a prohibition button B**34** that receives setting of disallowing (NO) the reception of an external command.
[0176] The user can set whether or not to receive an external command for each authenticated user by selecting either the permission button B**32** or the prohibition button B**34**. The setting content

received on the external command reception setting screen W**80** is stored in the command reception setting table.
[0177] FIG. **20** is a diagram illustrating a configuration example of a port use setting screen W**90** that receives port use setting for each authenticated user. The port use setting screen W**90** includes a permission button B**36** that receives setting of allowing the use of a port (port number) and a prohibition button B**38** that receives setting of disallowing (NO) the use of a port (port number).
[0178] The user can perform port use setting for each authenticated user by selecting either the permission button B**36** or the prohibition button B**38**. The setting content received on the port use setting screen W**90** is stored in the port use setting table. Alternatively, the port use setting table to store the available port setting for the device itself may be provided. In this case, the same port availability is applied to any user on the basis of the setting in the table.
[0179] As described above, according to the first embodiment, with the authentication mode enabled, the display of the device information is controlled on the basis of the setting applied to each authenticated user such as reception of an external command and port use, so that it is possible to reduce the trouble associated with the display of the device information. Consequently, it is possible to provide an image processing device or the like with excellent operability.
2 Second Embodiment
[0180] A second embodiment is a form in which different operation authority can be applied to each authenticated user.
2.1 Functional Configuration
[0181] A functional configuration of a multifunction peripheral according to the second embodiment can be substantially similar to that of the multifunction peripheral **10** according to the first embodiment. Afunctional configuration of a terminal device can also be substantially similar to that of the terminal device **30** according to the first embodiment. Therefore, in the second embodiment, identical configurations will be marked with the same reference numerals and the description thereof will be omitted.
2.2 Flow of Process
2.2.1 Process of Multifunction Peripheral **10**
[0182] The second embodiment differs from the first embodiment in the process after the process pertaining to user authentication in Step S**330** of FIG. **8**. Therefore, Step S**330** and subsequent processes will be described with reference to the flowchart in FIG. **21**.
[0183] In a case where user authentication is successful in Step S**330**, a controller **11** refers to a user information table (Yes in Step S**330**.fwdarw.Step S**380**). On the other hand, in a case where the user authentication is not successful, the controller **11** returns the process to Step S**320** (No in Step S**330**.fwdarw.Step S**320**).
[0184] The controller **11** refers to the user information table to determine a device information type A for each authenticated user (Step S**400**).
[0185] In a case where it is determined that the device information type A is “type 1”, the controller **11** shifts the process to Step S**140** in FIG. **7** (Step S**400**; “type 1”.fwdarw.“Step S**140**”). In a case where it is determined that the device information type A is “type 2”, the controller **11** displays a display screen in which the device information is hidden (Step S**400**; “type 2”.fwdarw.Step S**410**). In a case where “close button” is selected on the display screen, the controller **11** displays a home screen (Step S**210** in FIG. **7**), processes in Step S**220** and Step S**200** are executed.
[0186] Furthermore, in a case where the controller **11** determines that the device information type A is “type 3”, the processes pertaining to Step S**420** to Step S**470** corresponding to Step S**140** to Step S**200** in FIG. **7** (Step S**400**; “type 3”.fwdarw.Step S**420** to Step S**470**) are executed.
[0187] Herein, The device information type A according to the second embodiment will be described with reference to FIG. **22**. FIG. **22** is a diagram illustrating a data configuration example of a user information table according to the second embodiment.
[0188] The user information table illustrated in FIG. **22** includes “ID”, “password”, “user name”,

and “device information type A”. The “ID”, the “password”, and the “username” are the same items included in the authentication information table illustrated in FIG. **9**A. The “device information type A” represents operation authority set for each authenticated user.

[0189] Herein, the type 1 is operation authorization given to a user who is allowed to operate a device from a body when the device information is displayed and the display of the device information is canceled. The type 2 is operation authority given to a user who is not allowed to display the device information and is only allowed to operate the device from the body. The type 3 is operation authority given to a user who can operate only from the displayed device information.

[0190] In other words, in the second embodiment, different operation authority can be given to each authenticated user. For example, a user who has a network connection problem in exchanging information via device information or a user who does not wish to remotely operate a multifunction peripheral should be given the operation authority pertaining to the type 2, and only operation from the multifunction peripheral body should be permitted. On the other hand, it is possible to restrict operation from the body of the multifunction peripheral by giving the operation authority according to the type 3 to the user who may perform unnecessary operation on the multifunction peripheral.

[0191] FIG. **22** is an example in which the “type 1” of the device information type A is set to the “user name Ai Ueo” pertaining to “ID 0001” and the “user name Kaki Kukeko” pertaining to “ID 0002”. Similarly, the “type 2” of the device information type A is set to the “user name Tachi Tsuteto” pertaining to “ID 0003”, and the “type 3” of the device information type A is set to the “user name Nani Nuneno” pertaining to “ID 0004”.

[0192] FIG. **23**A is a diagram illustrating a form of a display screen W**40***a* that is displayed in a case where the device information type A is set to the “type 1”. In a case where the device information type A is the “type 1”, a QR code® as device information is displayed in a device information display area R**16**, and a close button B**22**, which receives an instruction to cancel the display of device information (display screen W**40***a*), is also displayed. By the selection of the close button B**22**, the home screen W**30** illustrated in FIG. **12** is displayed, and a user can operate from the body of the multifunction peripheral **10**.

[0193] FIG. **23**B is a diagram illustrating a form of a display screen W**40***b* that is displayed in a case where the device information type A is set to the “type 2”. In a case where the device information type A is the “type 2”, the QR code® as device information is displayed in the device information display area R**16**. However, the close button B**22** is displayed, and therefore the user can operate from the body of the multifunction peripheral **10** via the home screen W**30**.

[0194] FIG. **23**C is a diagram illustrating a form of a display screen W**40***c* that is displayed in a case where the device information type A is set to the “type 3”. In a case where the device information type A is the “type 3”, the QR code® as the device information is displayed in the device information display area R**16**, but the close button B**22** is not displayed. The close button B**22** is not provided, and therefore the user cannot display the home screen W**30**, and cannot perform operation from the body of the multifunction peripheral **10**.

[0195] As described above, according to the second embodiment, it is possible to reduce the trouble associated with the display of the device information, and different operation authority can be granted to each authenticated user, and give operation authority for each authenticated user, and therefore it is possible to manage each authenticated user in accordance with the operation authority, and perform more flexible device operation.

3 Third Embodiment

[0196] A third embodiment is a form in which determination information pertaining to display propriety of device information is acquired from a terminal device **30**.

3.1 Functional Configuration

[0197] A functional configuration of a multifunction peripheral according to the third embodiment can be substantially similar to that of the multifunction peripheral **10** according to the first embodiment. Afunctional configuration of a terminal device can also be substantially similar to that

of the terminal device **30** according to the first embodiment. Therefore, in the third embodiment, identical configurations will be marked with the same reference numerals and the description thereof will be omitted.

3.2 Flow of Process

3.2.1 Process of Multifunction Peripheral **10**

[0198] The third embodiment differs from the first embodiment in the process after the process pertaining to user authentication in Step S**330** of FIG. **8**, similar to the second embodiment. Therefore, Step S**330** and subsequent processes will be described with reference to the flowchart in FIG. **24**.

[0199] In a case where user authentication is successful in Step S**330**, a controller **11** refers to a user information table (Yes in Step S**330**.fwdarw.Step S**380**). On the other hand, in a case where the user authentication is not successful, the controller **11** returns the process to Step S**320** (No in Step S**330**.fwdarw.Step S**320**).

[0200] The controller **11** refers to the user information table to determine a device information type B for each authenticated user (Step S**480**).

[0201] In a case where it is determined that the device information type B is "type B ON", the controller **11** shifts the process to Step S**140** in FIG. **7** (Step S**480**; "type B ON".fwdarw."Step S**140**"). In a case where it is determined that the device information type B is "type B OFF", the controller **11** displays a display screen in which the device information is hidden (Step S**480**; "type B OFF".fwdarw.Step S**490**). In a case where "close button" is selected on the display screen, the controller **11** displays a home screen (Step S**210** in FIG. **7**), processes in Step S**220** and Step S**200** are executed.

[0202] Furthermore, in a case where the controller **11** determines that the device information type B is "type B EXT", it is determined whether or not display propriety determination information as determination information pertaining to display propriety of the device information is received from the terminal device **30** (Step S**480**; "type B EXT".fwdarw.Step S**800**).

[0203] In a case where it is determined that the display propriety determination information is received from the terminal device **30**, and the device information type B is the "type B ON", the controller **11** shifts the process to Step S**140** in FIG. **7** (Step S**810**; "type B ON".fwdarw."Step S**140**"). In a case where it is determined that the device information type B is the "type B OFF", the controller **11** displays the display screen with the hidden device information is displayed (Step S**810**; "type B OFF".fwdarw."Step S**490**"). In a case where "close button" is selected on the display screen, the controller **11** displays a home screen (Step S**210** in FIG. **7**), processes in Step S**220** and Step S**200** are executed.

[0204] In a case where the display the propriety determination information is not received from the terminal device **30**, the controller waits until the propriety determination information is received (No in Step S**810**).

3.2.2 Process of Terminal Device **30**

[0205] As to a flow of the process of the terminal device **30** according to the third embodiment, only the transmission of the display ON/OFF information of the device information is added to the process pertaining to Step S**510** described in FIG. **10** of the first embodiment, and the other processes can be performed in the same manner. Therefore, the process of the terminal device **30** herein will be omitted.

[0206] FIG. **25**A is a diagram illustrating a data configuration example of a user information table according to the third embodiment.

[0207] The user information table illustrated in FIG. **25**A includes "ID", "password", "user name", and "device information type B". The "ID", the "password", and the "username" are the same items included in the authentication information table illustrated in FIG. **9**A. The "device information type B" is an item that represents the display or non-display of device information for each authenticated user as "ON/OFF". The user information table differs from the user information

table illustrated in FIG. **9**D of the first embodiment in that the determination information pertaining to the display propriety of display device information is acquired from the terminal device **30**.

[0208] For example, for an authenticated user with “User Name Nani Nuneno” pertaining to “ID 0004”, “EXT” (acquire display propriety determination information from the terminal device **30**) is set as “device information type B”.

[0209] FIG. **25**B is a diagram illustrating a data configuration example of the display propriety determination information transmitted to the multifunction peripheral **10** by the terminal device **30** in Step S**510** of FIG. **10**. FIG. **25**B is an example of applying the setting of turning on the display of device information to the authenticated user with “user name Nani Nuneno” pertaining to “ID0004”.

3.3 Operation Example

[0210] Now, an operation example according to the third embodiment will be described with reference to FIGS. **26**A and **26**B. FIGS. **26**A and **26**B are a diagram illustrating an operation example in which the display propriety determination information is generated via an application screen W**50** of the terminal device **30**.

[0211] When a user selects an application setting button B**40** included in a favorite list display area R**20** of the application screen W**50** illustrated in FIG. **26**A, a controller **31** displays an application setting area R**28** illustrated in FIG. **26**B. The application setting area R**28** includes a QR display setting item. The user can enable (ON) the display of the device information by selecting an ON button B**42** provided in the application setting area R**28**. On the other hand, in a case where the display of the device information is to be disabled (OFF), the user can set the display of the device information to be disabled (OFF) by selecting an OFF button B**44**.

[0212] As described above, according to the third embodiment, it is possible to reduce the trouble associated with the display of the device information, and since the display propriety determination information pertaining to the display determination of the device information is acquired from the terminal device and and set, it is possible to perform more flexible device operation in cooperation with the terminal device.

4 Fourth Embodiment

[0213] A fourth embodiment is a form related to an output system including a multifunction peripheral, a terminal device, and a network service. The terminal device can execute a job of the multifunction peripheral through the network service.

[0214] FIG. **27** is a diagram illustrating an overall configuration of an output system **200** according to the fourth embodiment. The output system **200** includes a multifunction peripheral **10**, a terminal device **30**, and a network service **50**. The output system **200** can be separately provided with an external authentication server (not illustrated) or the like that authenticates a user to the multifunction peripheral **10**.

[0215] The multifunction peripheral **10** is communicatively connected to the network service **50** via a network (NW) illustrated in a solid line in the figure. The terminal device **30** is configured so as to be able to acquire device information from the multifunction peripheral **10**.

4.1 Functional Configuration

[0216] A functional configuration of the multifunction peripheral according to the fourth embodiment can be substantially similar to that of the multifunction peripheral **10** according to the first embodiment. Afunctional configuration of a terminal device can also be substantially similar to that of the terminal device **30** according to the first embodiment. Therefore, in the fourth embodiment, identical configurations will be marked with the same reference numerals and their description will be omitted.

4.1.1 Network Service **50**

[0217] The network service **50** is a computing system, which is referred to as a so-called cloud, and provides a predetermined service such as a processing resource, a storage resource, and a delivery resource via, for example, a web browser. The service provided by the network service **50** may be

used by accessing from the multifunction peripheral **10** or the terminal device **30** via the network (NW) using any data communication protocol such as a transfer control protocol, an Internet protocol, and other protocols. The network service **50** includes one or more network devices as hardware. In the following description, when no special hardware configuration is described, the hardware will be simply described as the network service **50**.

[0218] FIG. **28** is a functional configuration diagram illustrating a configuration example of the hardware included in the network service **50**. The network service **50** includes a controller **51**, a display **53**, an operation inputter **55**, a communicator **57**, and a storage **59**.

[0219] The controller **51** controls the overall network service **50**. The controller **51** is composed of, for example, one or more arithmetic devices (such as CPUs). The controller **51** reads and executes various programs stored in the storage **59** to implement functions thereof.

[0220] The display **53** displays various pieces of information to a user and the like. The display **53** can include, for example, an LCD, an organic EL display, of the like.

[0221] The operation inputter **55** receives input of information performed by the user or the like. As the operation inputter **55**, an inputter such as a keyboard, a mouse, and a touchpad can be used, for example.

[0222] The communicator **57** includes either a wired or wireless interface or both wired and wireless interfaces to communicate with other devices via a LAN, a WAN, the Internet, a telephone line, or the like.

[0223] The storage **59** stores various programs needed for the operation of the network service **50** and various types of data. The storage **59** may include a storage device such as a RAM, an HDD, an SSD, and a ROM.

[0224] In the fourth embodiment, the storage **59** stores a terminal device authentication program **591**, and a job transmission program **593**, and ensure a job storage area **595**.

[0225] The terminal device authentication program **591** is a program read by the controller **51** when the connection with the terminal device **30** is authenticated. The controller **51** which reads the terminal device authentication program **591** authenticates the connection with the terminal device **30** on the basis of a session key of connection information transmitted together with an external command when the external information including setting information is transmitted from the terminal device **30**.

[0226] The job transmission program **593** is a program read by the controller **51** when a job is transmitted to the multifunction peripheral **10**. The controller **51** that has read the job transmission program **593** searches for a job corresponding to the device ID of the multifunction peripheral **10** to HTTPS (Hyper text transfer protocol secure) long polling from the multifunction peripheral **10**, for example. In a case where the job corresponding to the device ID of multifunction peripheral **10** is stored in the job storage area **595**, the controller **51** reads the job and transmits the job to the multifunction peripheral **10**.

[0227] The job storage area **595** is a storage area in which an external command with a job ID, transmitted from the terminal device **30**, is stored. The job ID may also be given by the terminal device **30**. In this case, the terminal device **30** only needs to give the job ID to setting information and connection information included in the external command and transmit the information to the network service **50**. The controller **51** that receives the external command is stored as the job in the job storage area **595**.

[0228] Herein, FIG. **29** is a diagram illustrating a data configuration example of the job stored in the job storage area **595**. The connection information and the setting information is identical to those illustrated in FIG. **5**A. The controller **51** that receives these information as an external command gives a "job ID" (e.g., "#**0001**") for uniquely identifying the job to the connection information and the setting information, and stored these information in the job storage area **595**.

4.2 Flow of Process

4.2.1 Overall Process

[0229] Now, an overall process according to the fourth embodiment will be described with reference to a flowchart in FIG. **30**. The overall process described with reference to FIG. **30** can be performed in substantially the same manner as the overall process described in FIG. **6** of the first embodiment, except that the transmission destination of the external command is the network service **50** and the destination of the job acquisition is the network service **50**. Therefore, identical step numbers will be given to parts that can be processed in the same manner, and description thereof will be omitted.
[0230] In Step S**30**, when the terminal device **30** acquires device information from the multifunction peripheral **10**, the terminal device **30** uses necessary connection information included in the device information to transmit the generated setting information as a command to the network service **50** (Step S**36**).
[0231] The network service **50** stores the received command as a job in the job storage area **595** (Step S**38**).
[0232] The multifunction peripheral **10** performs, for example, HTTPS long polling to the network service **50**, and queries whether or not the job of the multifunction peripheral **10** exists (Step S**40**).
[0233] In a case where the job of the multifunction peripheral **10** exists, the network service **50** establishes connection with the multifunction peripheral **10** and transmits the job (Step S**42**).
[0234] The multifunction peripheral **10** executes the received job (Step S**44**).
[0235] The individual processes by the multifunction peripheral **10** and the terminal device **30** can be substantially similar to those in the first embodiment and the like, and will not be described herein.
4.2.2 Process of Network Service **50**
[0236] Now, a process of the network service **50** will be described with reference to FIG. **31**. The controller **51** of the network service **50** determines whether or not an external command is received from the terminal device **30** (Step S**700**).
[0237] When it is determined that the external command is received, the controller **51** stores the setting information and the like included in the external command with job ID in a job storage area **997** (Step S**700**; Yes.fwdarw.Step S**710**). On the other hand, when it is determined that no external command is received, the controller **51** waits until an external command is received (Step S**700**; No).
[0238] Next, the controller **51** determines whether or not a request for acquiring a job by HTTPS long polling is received from the multifunction peripheral **10**, for example (Step S**720**).
[0239] When it is determined that the request for acquiring a job is received, the controller **51** determines whether or not a job corresponding to the multifunction peripheral **10** which receives the acquisition request is stored (Step S**720**; Yes.fwdarw.Step S**730**). On the other hand, when it is determined that the request for acquiring a job is not received, the controller **51** waits until the request for acquiring a job is received (No in Step S**720**).
[0240] In a case where it is determined that the job corresponding to the multifunction peripheral **10** which receives the acquisition request is stored, the controller **51** transmits the job to the multifunction peripheral **10** (Yes in Step S**730**.fwdarw.Step S**740**). On the other hand, in a case where it is determined that the job corresponding to the multifunction peripheral **10** which receives the acquisition request is not stored, the controller **51** performs error display and terminates the process (Step S**730**; No.fwdarw.Step S**750**).
[0241] As described above, according to the fourth embodiment, in addition to the effects of the first embodiment, the job pertaining to an external command transmitted from the terminal device is managed by the network service, and therefore it is possible to reduce the system resources and the like of the terminal device for remote operation.
[0242] The present disclosure is not limited to each embodiment described above, and various modifications can be made. That is, the technical scope of the present disclosure also includes an embodiment acquired by combining technical measures modified as appropriate without departing

from the scope of the present disclosure.
[0243] Furthermore, although some parts of the above embodiments are described separately for convenience of explanation, it is needless to say that the embodiments may be combined and implemented within a technically possible range.
[0244] The programs that operate in each device in the embodiments are programs that control CPUs and the like (programs that make computers function) to realize the functions of the embodiments described above.
[0245] According to the embodiment, it is assumed that the device simultaneously executes a plurality of programs as needed by a multitask process. The information handled by these devices is temporarily stored in a temporary storage device (for example, a RAM) at the time of the process, and then stored in various storage devices such as a ROM and an HDD to be read, corrected, and written by the CPU as needed.
[0246] Herein, as the recording medium for storing the program, a semiconductor medium (e.g., a ROM or a non-volatile memory card), an optical recording medium/magneto-optical recording medium (e.g., a digital versatile disc (DVD), a magneto optical disc (MO), a mini disc (MD), a compact disc (CD), or a Blu-ray (BD)® disc, a magnetic recording medium (e.g., a magnetic tape or a flexible disc) or the like may be used. The functions of the present disclosure may also be realized not only by executing the loaded programs, but also processing in cooperation with the operating system, other application programs, or the like in accordance with the instructions of the programs.
[0247] Furthermore, when the program is to be distributed to the market, the program may be stored in a portable recording medium for distribution or transferred to a server computer connected via a network such as the Internet. In this case, a storage device of the server computer is also included in the present disclosure.

Claims

1. An image processing device comprising: a display that displays device information; and a controller that comprises: one or more processors; and a storage coupled to the one or more processors and storing one or more computer-readable instructions that, when executed by the one or more processors, cause the image processing device to: generate the device information including identification of the image processing device; execute a copy job based on setting information pertaining to an execution of the copy job transmitted from a terminal device; perform a user authentication; and control, under a controlling mode for requiring the user authentication, based on an authenticated user, a display of a first screen for displaying the device information as a screen to be displayed after the user authentication.
2. The image processing device according to claim 1, wherein the one or more computer-executable instructions, when executed by the one or more processors, further cause the image processing device to control the display of the first screen as the screen to be first displayed after the user authentication.
3. The image processing device according to claim 1, wherein the one or more computer-executable instructions, when executed by the one or more processors, further cause the image processing device to control a display of a second screen from which various functions including copy function is selectable, as a screen to be displayed after the user authentication, based on the authenticated user.
4. The image processing device according to claim 1, wherein the storage further stores user information set for each user including information related to operation authority for the image processing device.
5. An image processing device comprising: a display that displays device information; and a controller that comprises: one or more processors; and a storage coupled to the one or more

processors and storing one or more computer-readable instructions that, when executed by the one or more processors, cause the image processing device to: generate the device information including identification information of the image processing device; execute a copy job based on setting information pertaining to an execution of the copy job transmitted from a terminal device; perform a user authentication; and control, under a controlling mode for requiring the user authentication, based on an authenticated user, a display of a first screen for initiating a connecting operation with a terminal device as a screen to be displayed after the user authentication.

6. The image processing device according to claim 5, wherein the one or more computer-executable instructions, when executed by the one or more processors, further cause the image processing device to control the display of the first screen as the screen to be first displayed after the user authentication.

7. The image processing device according to claim 5, wherein the one or more computer-executable instructions, when executed by the one or more processors, further cause the image processing device to control a display of a second screen from which various functions including copy function is selectable, as a screen to be displayed after the user authentication, based on the authenticated user.

8. The image processing device according to claim 5, wherein the storage further stores user information set for each user including information related to operation authority for the image processing device.