Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an image forming apparatus for reading and automatically setting an image formation mode stored in an external memory means such as an IC card.

Related Background Art

In recent office processing, various types of copy processing are required. In order to satisfy these requirements of users, therefore, an intelligence of copy functions has been rapidly improved, and keys for setting various types of functions such as two-side copying, multi transfer, trimming, stamp copying, and add-on copying and indicators therefor are normally arranged on an operation unit.

Some users, however, may perform only simple copying such as one-side equal-magnification copying. In addition, if a user usually executes copy work in a complicated but the same copy mode, he or she must perform a complicated copy mode setting operation upon each copying and, therefore, easily causes a setting error. Furthermore, since a considerably long time is required before a desired image is output, image formation cannot be performed with high efficiency.

In order to eliminate the above drawbacks, therefore, a copying apparatus in which a copy mode having a high use frequency can be registered in a back-up memory medium and automatically set by a simple operation using, e.g., a key is proposed.

In an apparatus of this type, however, the number of copy modes capable of being registered is limited. Therefore, this apparatus cannot satisfactorily achieve its effect in an office or the like with a large number of users.

In addition, an apparatus has been proposed in which a copy mode used by a specific user is stored in external memory means such as an IC card and automatically set upon copy mode setting. The external memory means of an apparatus being of this type, however, can be used only in a one-to-one operational environment with respect to a specific copying apparatus. Therefore, a copy mode stored in this external memory means can not be read out by an apparatus of another type, resulting in very low versatility.

Moreover, from document EP-A-252613, a copy system is known using an IC card and having a copying unit and an input tablet separated therefrom, wherein an original to be copied can be put onto the input tablet, and a desired copy mode related to the original can be designed and edited by means of input devices provided at the input tablet using the original, and be written into the memory of the IC card inserted in the input tablet, from which the stored copy mode is transferred to the copying unit and read and executed accordingly thereat upon insertion of the card into the copying unit after the original related to the stored copy mode has also been put onto the copying unit.

SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above situation, and has as object to provide an improved image forming apparatus.

It is another object of the present invention to allow an external memory means storing an image formation mode to be used between arbitrary types of machines.

It is a further object of the present invention to provide improved operability of an image forming apparatus capable of setting an image formation mode by using an external memory means storing an image information mode.

These objects are achieved by an image forming apparatus from which external memory means storing an image formation mode is arbitrarily detachable, comprising image forming means for forming an image on a recording medium in a desired image formation mode, and inserting means for inserting said external memory means, the image forming apparatus being characterized by determining means for determining realizability/unrealizability of the image formation mode stored in said external memory means inserted in said inserting means, and alarming means for alarming the determination result from said determining means.

The above objects are alternatively achieved by an image forming apparatus from which external memory means storing a plurality of image formation modes is arbitrarily detachable, comprising image forming means for forming an image on a recording medium in a desired image formation mode, and inserting means for inserting said external memory means, characterized by detecting means for detecting insertion of said external memory means in said inserting means, selecting means being arranged for manually selecting a desired image formation mode from a plurality of image formation modes stored in said external memory means, and control means for selecting and setting a predetermined image formation mode from a plurality of image formation modes stored in said external memory means in accordance with a detection output from said detecting means.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a block diagram for explaining an arrangement of an image forming apparatus according to an embodiment of the present inven-

tion;

Fig. 1B is a perspective view for explaining the outer appearance of the image forming apparatus shown in Fig. 1A;

Figs. 2A and 2B are plan views for explaining a main part of a first arrangement of an operation unit shown in Fig. 1;

Fig. 3 is a plan view for explaining a main part of a second arrangement of the operation unit shown in Fig. 1;

Fig. 4A is a flow chart for explaining a first copy mode processing selecting processing sequence of an apparatus according to the present invention;

Fig. 4B is a flow chart for explaining a copy mode registering processing sequence of an apparatus according to the present invention;

Fig. 4C is a flow chart for explaining a first copy mode reading processing sequence of an apparatus according to the present invention;

Fig. 5 is a flow chart for explaining a second copy mode reading processing sequence of an apparatus according to the present invention;

Fig. 6 is a flow chart for explaining a third copy mode reading processing sequence of an apparatus according to the present invention;

Fig. 7A is a flow chart for explaining a second copy mode processing selecting processing sequence of an apparatus according to the present invention;

Fig. 7B is a flow chart for explaining a third copy mode processing selecting processing sequence of an apparatus according to the present invention;

Figs. 8A to 8I are views showing display transition for explaining a message display state on a display shown in Fig. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS:

An embodiment of the present invention will be described in detail below with reference to the accompanying drawings.

Fig. 1A is a block diagram for explaining an arrangement of an image forming apparatus according to an embodiment of the present invention. Referring to Fig. 1A, an IC card 8 (external mode memory means) is inserted in an insertion port 1. An IC card device 7 which also serves as a detecting means monitors insertion of the IC card 8 in the insertion port 1 and outputs an insertion detection signal to a controller unit 6. The controller unit 6 systematically controls the respective units in accordance with control programs (including sequences of flow charts to be described later) stored in a ROM 6d.

An image forming unit 5 is constituted by a photosensitive drum, a developer, a transfer charger, a fixer, a paper conveying mechanism, and the like (none of which are shown).

A determining means 6a determines realizability of each copy mode stored in the IC card 8 in accordance with an output from the IC card device 7 and sends the determination result to an alarming means 6b and a selective setting means 6c. The alarming means 6b causes a display 2a of an operation unit 2 to display information in accordance with the determination result. The selective setting means 6c selects and automatically sets a realizable one of a plurality of copy modes from the IC card 8 so that the selected mode can be set later prior to others (as will be described in detail later).

A copy mode set by an arbitrary type of machine is written in the IC card 8 constituting an external mode memory means on the basis of a common data format. The IC card 8 can be inserted in the insertion port 1 of an arbitrary type of machine.

When the IC card device 7 detects insertion of the IC card 8, the determining means 6a determines realizability of a stored operation mode, and the alarming means 6b sends the determination result to the display 2a. If the operation mode is realizable, the selective setting means 6c selects and automatically sets one copy mode stored in the external mode memory means, thereby enabling the use of an arbitrary copy mode set by an apparatus of another type.

In accordance with the determination result from the determining means 6a, the selective setting means 6c selectively sets, as a first candidate, one copy mode which is lastly accessed from the IC card 8 by the selective setting means 6c and automatically sets one copy mode in correspondence with its setting history.

Immediately after the IC card device detects the insertion of the IC card 8, the selective setting means 6c sets a write/read mode selection state with respect to the IC card 8 as an operation mode, thereby easily switching access to the IC card 8.

In addition, immediately after the IC card device 7 detects the insertion of the IC card 8, the selective setting means 6c sets a read mode with respect to the IC card 8 as an operation mode prior to other modes, thereby rapidly setting a copy mode stored in the IC card 8.

Fig. 1B is a perspective view for explaining the outer appearance of the image forming apparatus shown in Fig. 1A, in which the same reference numerals as in Fig. 1A denote the same parts.

Referring to Fig. 1B, an original table glass 3 is placed in a reference position and pressed by an original pressing plate 4.

The setting of a copy mode of an image forming apparatus of another type will be described below with reference to Figs. 2A, 2B, and 3.

Figs. 2A and 2B are plan views for explaining a main part of a first arrangement of the operation unit

2 shown in Fig. 1, in which a first operation unit is illustrated as two parts separated by a curve.

Referring to Figs. 2A and 2B, a power switch 101 controls the power supply to a copying machine (image forming apparatus). A reset key 102 operates as a key for restoring a standard mode in a stand-by state. This operation unit also includes a copy key 103 and a color developer selective switching key for selectively switching a plurality of developers (not shown).

Ten keys 105 are used to input mainly the number of copies. A cassette selection key 106 is used to designate the destination of paper supplied from a paper supply mechanism such as a pedestal (not shown). A copy density adjusting key 107 is used to adjust a copy density, and an equal-magnification key 108 is depressed to select equal-magnification copy. A zoom key 109 is used to designate a copy magnification in units of predetermined magnifications, e.g., 1%.

A pair of regular magnification keys 110 are depressed to designate a regular reduction or enlargement magnification. A frame erasing key 111 is depressed to erase a frame of a copied sheet. A gutter key 112 is depressed to form a gutter at one end of a copied sheet. A photograph mode key 113 is depressed to copy a half-tone image such as a photographic original.

An area designation key 125 is depressed to perform area designation. An area call key 126 is depressed to partially correct the contents of an area set by the area designation key 125. A guide key 117 is depressed to check the contents of each function. A preheating mode key 131 is used to set a preheating mode.

A multi key 114 is depressed to select a multi mode. A continuous copy key 115 is depressed to divide a copy area of the original table glass 3 into two, right and left parts (division areas change in accordance with the size of a copy sheet), thereby automatically, continuously copying images on two sheets. A two-side key 116 is depressed to select a two-side copy mode. Sorter keys 119 and 120 are depressed to designate an operation mode (grouping, sorting, or the like) of a sorter. Character keys 122 to 124 are depressed to form data information (having a plurality of types of data recording schemes) which is updated and stored beforehand on a copy sheet. The character key 123 is depressed to form memorandum information input by depressing character keys provided on a digitizer (not shown) on a copy sheet. The character key 124 is depressed to form numbering information on a copy sheet. Mode memory keys 127 and 128 are depressed to store a copy mode set by the operation unit 2 in a main body memory (a (back-up) RAM of the controller unit 6). An IC card key 129 is depressed to store a copy mode set by the operation unit 2 in the IC card 8 shown in Fig. 1A.

An auto magnification change key 130 is depressed to automatically enlarge or reduce an original image in accordance with the size of a transfer sheet.

An up key 133 and a down key 134 are depressed to move a designation guide (in this embodiment, a triangular mark) displayed on a screen of a display 138, thereby designating an element to be selected. The display 138 is constituted by a liquid crystal display device with a back light and displays the number of copies, a transfer sheet size, a set magnification, a message, and the like. After an asterisk key 132 is depressed, the ten keys 105 are depressed to set various types of modes. The operation unit also includes a registration key 135 and a password key 136.

Indicators 139 to 150 are constituted by light-emitting diodes (LEDs). When a sorter is to be used, the indicator 139 is turned on to indicate a sort mode, a group mode, or the like. The indicator 140 is turned on when an automatic copy density adjustment (AE) key 137 is depressed, for automatically adjusting a copy density in accordance with the density of an original or for releasing the automatic copy density adjustment (AE) to set manual density adjustment, and the indicator 141 indicates a density level corresponding to a density set by the density key 137. When a color developer is selected from a plurality of developers stored in a developer storage unit, which is arranged in a main body of the apparatus or optionally provided, a light having a color corresponding to the color of the selected developer is emitted by the indicator 142. The indicator 143 is turned on when the auto magnification change key 130 is depressed. The indicator 144 is turned on when the photograph mode is set. The indicator 145 is turned on when the date write mode is set. The indicator 146 is turned on when area designation is set. The indicator 147 is turned on when the gutter mode is set. The indicator 148 is turned on when the memo write mode is set. The indicator 149 is turned on when the frame erase mode is set. The indicator 150 is turned on when the number write mode is set.

Fig. 3 is a plan view showing a main part for explaining a second arrangement of the operation unit 2.

Referring to Fig. 3, an asterisk key (* key) is used by an operator (user) in a mode for setting a gutter or a size of original frame erasure. An all reset key 606 is depressed to restore a standard mode. A preheating key 602 is depressed to set the main body in a preheating state or to release the preheating state. The preheating key is also depressed in order to restore the standard mode from an auto shut-off state.

A copy start key 605 is depressed to start copying. A clear/stop key 604 functions as a clear key in a stand-by state and as a stop key during copy recording. The clear/stop key 604 is depressed to release a set number of copies and to release an asterisk mode. When the clear/stop key 604 is depressed to interrupt

continuous copying, a copy operation is stopped after copying being executed upon depression is finished.

Ten keys 603 are depressed to set the number of copies. The ten keys 603 are also used to set the asterisk mode. A memory key 619 is depressed to register a mode which is frequently used by a user in a main body memory. The memory key 619 is substantially the same as the mode memory keys 127 and 128 shown in Fig. 2B.

An IC card key 619a is depressed to store a copy mode which is frequently used by a user in the IC card 8.

Copy density keys 611 and 612 are depressed to manually adjust a copy density. When the IC card key 619a is depressed, the copy density keys 611 and 612 also function as keys for moving a mark serving as a designation guide on a display 701 until mode setting is finished. An AE key 613 is depressed to automatically adjust a copy density in accordance with the density of an original or to release AE (automatic copy density adjustment) to set manual density adjustment. A cassette selection key 607 is depressed to select one of an upper cassette, a middle cassette, and a lower paper deck. An auto paper cassette selection key 627 is used to automatically select a cassette corresponding to an original and a designated magnification.

An equal magnification key 610 is depressed to obtain a copy in an equal magnification (original size). An auto magnification change key 616 is depressed to automatically enlarge or reduce an original image in accordance with the side of a designated transfer sheet. Zoom keys 617 and 618 are depressed to designate an arbitrary magnification from 50% to 200%.

Regular magnification change keys 608 and 609 are depressed to designate reduction or enlargement of a regular size.

A two-side key 626 is depressed to perform two-side copying from a one-side original or two-side or one-side copying from a two-side original. A gutter key 625 is used to form a gutter having a designated length at a left side of a transfer sheet. A photograph key 624 is depressed to copy a photographic original. A multi key 623 is depressed to form (synthesize) an image on one surface of a transfer sheet from two originals.

An original frame erase key 620 is depressed to erase a frame of a regular size original. Upon frame erasure, the size of an original is set by the asterisk key 601. A sheet frame erase key 621 is depressed to erase a frame of an original in accordance with the size of a cassette.

A page continuous copy key 622 is depressed to copy right and left pages of an original on different sheets.

A paper discharge method (stapling, sorting, and grouping) selection key 614 is used to select or to release a staple mode or a sort mode when a stapler capable of binding recorded sheets by staple is connected, and to select or to release a sort mode or a group mode when a sorting tray (sorter) is connected.

A paper folding selection key 615 is used to select or to release Z folding for folding A3- or B4-size recorded paper into a Z sectional shape or half folding for folding A3- or B4-size paper in half.

Each time a selection key 630 is depressed, black developer and a color developer are alternately selected.

A display 701 is of an LCD (liquid crystal display) type for forming one character by, e.g., 5 x 7 dots. The display 701 can display a message of 40 characters and a copy magnification set by the regular magnification change keys 608 and 609, the equal magnification key 610, and the zoom keys 617 and 618. The display 701 consists of a semi-transmission liquid crystal and uses back lights of two colors. A green back light is turned on in a normal operation, and an orange back light is turned on in an abnormal or copy disable state.

An equal magnification indicator 706 is turned when an equal magnification is selected. A developer indicator 730 indicates a selected developer. A copy number indicator 702 indicates a copy number or a self-diagnosis code. A cassette indicator 705 indicates a selected one of an upper cassette, a middle cassette, and a lower deck.

An AE indicator 704 is turned on when AE (automatic copy density adjustment) is selected by the AE key 613. A preheating indicator 709 is turned on in a preheating state. The preheating indicator 709 is turned on/off in an auto shut-off state. A ready/wait indicator 707 is constituted by two color LEDs of green and orange. A green light is turned on in a ready state (copy enable state), and an orange light is turned on in a wait state (copy disable state).

A two-side copy indicator 708 is turned on when two-side copying from a two-side original or a one-side original is selected.

When a standard mode RDF is used, copy conditions are a copy number of one, auto paper selection, an equal magnification, and one-side copying from a one-side original. In a standard mode not using an RDF, copy conditions are a copy number of one, a density manual mode, an equal magnification, and one-side copying from an one-side original.

A difference in conditions between the use and non-use of the standard mode RDF is determined on the basis of whether an original is set in the RDF.

A power lamp 710 is turned on when a power switch 712 is turned on. A copy density indicator 711 indicates a copy density.

A copy mode processing operation on the basis of the IC card 8 will be described below with reference to Figs. 4A to 4C.

Fig. 4A is a flow chart showing a first copy mode processing selecting processing sequence of an ap-

paratus according to the present invention. Note that reference numeral (1) denotes a step.

When the IC card key 129 is depressed registration/reading processing for the copy mode recording device is started, and the display 138 displays a mode selection item, in this case, copy mode registration/reading (see Fig. 8A).

The controller unit 6 checks whether registration or reading is selected by the up and down keys 133 and 134 (1). If registration is selected, the flow advances to copy mode registering processing to be described later. If reading is selected, the flow advances to copy mode reading processing.

Fig. 4B is a flow chart showing a copy mode registering processing of an apparatus according to the present invention. Note that reference numerals (1) to (3) denote steps.

The controller unit 6 displays a copy mode number to be registered on the display 138 as shown in Fig. 8H (1) and selects the copy mode number to be registered on the basis of an input from the up and down keys 133 and 134.

The controller unit 6 checks in accordance with a depression state of the asterisk key 601 whether various parameters such as a magnification and the number of copies currently set on the operation unit 2 are to be registered in the selected copy mode (2). If NO in step (2), the flow returns to step (1) to repeat the selecting processing. If YES in step (2), the controller unit 6 registers the parameters in the selected mode and displays the contents shown in Fig. 8I, thereby ending the processing.

Fig. 4C is a flow chart for explaining a first copy mode reading processing sequence of an apparatus according to the present invention.

When the reading processing is started, the controller unit 6 reads a mode which is the last to undergo reading/registration from registered copy modes (1) and displays the read mode on the display 138 as shown in Fig. 8B. The controller unit 6 checks in accordance with the depression state of the asterisk key 601 whether the copy mode designated by the designation guide is OK (2). If NO in step (2), another mode is selected by the up and down keys 133 and 134 (3), the selected copy mode is read from the IC card 8 (4), and the flow returns to step (2).

If YES in step (2), the controller unit 6 checks whether the read copy mode is a realizable mode of the copying machine in which the IC card 8 is inserted (5). If YES in step (5), the controller unit 6 ends the reading processing.

If NO in step (5), the controller 6 displays an alarm indication of "unrealizable" on the display 138 as shown in Fig. 8E (6).

The controller unit 6 displays an alarm indication of copy inhibition, i.e., a message shown in Fig. 8F on the display 138 (7), executes copy inhibition processing (8), and ends the processing.

Fig. 5 is a flow chart for explaining a second copy mode reading processing sequence of an apparatus according to the present invention. Note that reference numerals (1) to (10) denote steps.

When the reading processing is started, the controller unit 6 reads a mode which is the last to undergo reading/registration from registered copy modes (1) and displays the read mode on the display 138 as shown in Fig. 8B. The controller unit 6 checks in accordance with the depression state of the asterisk key 601 whether the copy mode designated by the designation guide is OK (2). If NO in step (2), the other mode is selected by the up and down keys 133 and 134 (3), the selected copy mode is read from the IC card 8 (4), and the flow returns to step (2).

If YES in step (2), the controller unit 6 checks whether the called copy mode is realizable. If YES in step (5), the controller unit 6 ends the reading processing.

If NO in step (5), the controller unit 6 checks whether all of the modes are unrealizable (6). If YES in step (6), the controller unit 6 causes the display 138 to display an alarm indication of "unrealizable" as a message shown in Fig. 8E (7). The controller unit 6 then causes the display 138 to display an alarm indication of copy inhibition as a message shown in Fig. 8F (8), executes copy inhibition processing (9), and ends the processing.

If NO in step (6), the controller unit 6 causes the display 138 to display an alarm indication of "partially unrealizable" (10), and ends the processing.

For example, if two-side copying is included in a selected copy mode and a copying machine in which the IC card is inserted has no two-side copy function, a message as shown in Fig. 8G is displayed on the display 138.

Fig. 6 is a flow chart for explaining a third copy mode reading processing sequence of an apparatus according to the present invention. Note that reference numerals (1) to (11) denote steps.

When the reading processing is started, the controller unit 6 reads a mode which is the last to undergo reading/registration from registered copy modes (1) and displays the read mode on the display 138 as shown in Fig. 8D.

The controller unit 6 checks whether the displayed copied mode is realizable (2). If YES in step (2), the controller unit 6 causes the display 138 to display a message shown in Fig. 8C and checks whether the other mode is to be selected by the up and down keys 133 and 134 (3). If NO in step (3), the controller unit 6 ends the reading processing. If YES in step (3), the flow advances to step (8) and subsequent steps.

If NO in step (2), the controller unit 6 causes the display 138 to display an alarm indication of "unrealizable" as a message shown in Fig. 8E (4). The controller unit 6 then causes the display 138 to display a message shown in Fig. 8C and checks whether the

other mode is to be selected by the up and down keys 133 and 134 (5). If NO in step (5), the controller unit 6 causes the display 138 to display an alarm indication of "unrealizable" as a message shown in Fig. 8E (6). The controller unit 6 then causes the display 138 to display an alarm indication of copy inhibition as a message shown in Fig. 8F, executes copy inhibition processing (7), and ends the processing.

If YES in step (5), the controller unit 6 causes the display 138 to display a message shown in Fig. 8B to select the other mode by the up and down keys 133 and 134. The controller unit 6 reads the selected copy mode (9) and checks in accordance with the depression state of the asterisk key whether the read mode is OK (10). If NO in step (10), the flow returns to step (8). If YES in step (10), the controller unit 6 checks whether the selected mode is realizable (11). If NO in step (11), the flow returns to step (4). If YES in step (11), the controller unit 6 ends the processing.

In each of the above first to third copy mode reading processing sequences, processing is executed on the basis of a key operation performed when the IC card 8 is already inserted in the apparatus. The copy mode reading processing, however, can be executed on the basis of the detection of the insertion of the IC card 8.

Fig. 7A is a flow chart showing a fourth copy mode processing selecting processing sequence. Note that reference numerals (1) and (2) denote steps.

When the controller unit 6 recognizes via the IC card device 7 that the IC card 8 as a copy mode memory device is inserted in the insertion port 1 (1), it causes the display 138 to display a message shown in Fig. 8A and checks whether registration of a copy mode is selected by the up and down keys 133 and 134 (2). If YES in step (2), the controller unit 6 starts registration processing. If NO in step (2), the controller unit 6 executes reading processing.

Fig. 7B is a flow chart showing a third copy mode processing selecting processing sequence of an apparatus according to the present invention. Note that reference numerals (1) and (2) denote steps.

When the controller unit 6 recognizes via the IC card device 7 that the IC card 8 is inserted in the insertion port 1 (1), it automatically switches a copy mode to one of the registered modes (2) and ends the processing.

In this manner, one of a plurality of copy modes (which may be given with a priority order) stored in the IC card 8 can be instantaneously set without an user operation.

As has been described above, the image forming apparatus of the present invention comprises an external mode memory means 8 which can store a copy mode to be set between arbitrary types of machines on the basis of a common data format, so that the mode can be read out/written in, and which can be inserted in/removed from an arbitrary type of machine, a detecting means 7 for detecting insertion of the external mode memory means 8, a determining means 6a for determining realizability of the copy mode stored in the external mode memory means 8 on the basis of an output from the detecting means 7, an alarming means 6b for alarming the determination result from the determining means to a display, 138; 701 and a selective setting 6c means for selecting and automatically setting one of the copy modes stored in the external mode memory means 8 on the basis of the determination result from the determining means 6a.

Therefore, a copy mode which is complicated and has a high use frequency can be set for arbitrary types of machines by one external mode memory means 8. Therefore, a desired copy mode can be set without using an operation panel in a plurality of different types of apparatuses. In addition, since unrealizability is alarmed if a copy mode is unrealizable, no error copy is produced. Furthermore, a load on an operator who is unskilled in copy modes can be largely reduced to increase use efficiency of the image forming apparatus.

In the image forming apparatus of the present invention, the selective setting means 6c selectively sets, as a first candidate, one copy mode which is last to undergo access from the external mode memory means 8 capable of storing a plurality of copy modes on the basis of the determination result from the determining means 6a. Therefore, a copy mode having a high use frequency can be set by only a few operation tasks in a plurality of types of machines.

In addition, a write/read mode selection state with respect to the external mode memory means 8 is set as an operation mode immediately after the detecting means 7 detects insertion of the external mode memory means 8. Therefore, since an operator can be clearly informed of registration/reading of a copy mode, copy errors caused by an erroneous operation can be reduced.

Furthermore, a read mode of the external mode memory means 8 is set as an operation mode prior to other modes immediately after the detecting means 7 detects insertion of the external mode memory means 8. Therefore, since a desired copy mode is set prior to other modes simultaneously with insertion of the external mode memory means 8 without considering copy mode setting, an operation can smoothly advance to image formation processing.

The image forming apparatus is not limited to a copying machine but may be applied to a facsimile apparatus, a printer, and the like.

In addition, a recording system is not limited to an electrophotographic system but may be an ink-jet system, a thermal transfer system, and the like.

Claims

1. An image forming apparatus from which external memory means storing an image formation mode is arbitrarily detachable, comprising

image forming means for forming an image on a recording medium in a desired image formation mode, and

inserting means for inserting said external memory means,

characterized by

determining means (6a) for determining realizability/unrealizability of the image formation mode stored in said external memory means (8) inserted in said inserting means (1), and

alarming means (6b) for alarming the determination result from said determining means (6a).

2. An apparatus according to claim 1, characterized in that said external memory means (8) is arranged to store a plurality of image formation modes stored in said external memory means (8),and that selecting means (6c) are provided for selecting a desired image formation mode from a plurality of image formation modes stored in said external memory means (8), wherein said determining means (6a) determines realizability/unrealizability of said image formation mode set by said selecting means (6c) on the basis of said selected image formation mode and the availability of apparatus functions required by said selected image formation mode.

3. An apparatus according to claim 1, characterized in that said alarming means (6b) is arranged to display a message indicating realizability/unrealizability in accordance with the determination result.

4. An apparatus according to any one of claims 1 to 3, characterized in that said external memory means (8) is an IC card (8).

5. An image forming apparatus from which external memory means storing a plurality of image formation modes is arbitrarily detachable, comprising

image forming means for forming an image on a recording medium in a desired image formation mode, and

inserting means for inserting said external memory means,

characterized by

detecting means (7) for detecting insertion of said external memory means (8) in said inserting means (1),

selecting means (133, 134) being arranged for manually selecting a desired image formation mode from a plurality of image formation modes stored in said external memory means (8), and

control means (6c) for selecting and setting a predetermined image formation mode from a plurality of image formation modes stored in said external memory means (8) in accordance with a detection output from said detecting means (7).

6. An apparatus according to claim 5, characterized in that said external memory means (8) is an IC card (8).

7. An apparatus according to claim 5, characterized by further comprising

selecting means (129, 133, 134; 611, 612, 619a) for selecting one of a registration mode for causing said external memory means (8) to record an image formation mode input by said input means (105 to 117, 119, 120, 122 to 126, 131; 601, 603, 607 to 627, 630) and a read mode for reading out an image formation mode recorded in said external memory means (8), and

control means (6c) for selecting the read mode in response to detection of insertion of said external memory means (8) by said detecting means (7).

8. An image forming apparatus according to claim 5, characterized in that said control means (6) is arranged to select and set the predetermined image formation mode based on a history of registration of the image formation mode.

9. An image formation apparatus according to claim 8, characterized in that said predetermined image formation mode is the last registered image formation mode.

10. An image forming apparatus according to claim 5, characterized in that said control means (6c) is arranged to select and set the predetermined image formation mode based on a history of reading of the image formation mode.

11. An image forming apparatus according to claim 10, characterized in that said predetermined image formation mode is the last read out image formation mode.

Patentansprüche

1. Bilderzeugungsgerät, von dem eine eine Bilderzeugungsart speichernde externe Speichereinrichtung beliebig abnehmbar ist, mit

* C L M S *

einer Bilderzeugungsvorrichtung zum Erzeugen eines Bildes auf einem Aufzeichnungsmedium in einer gewünschten Bilderzeugungsart und

einer Einsetzvorrichtung zum Einsetzen der externen Speichereinrichtung,
gekennzeichnet durch

eine Bestimmungseinrichtung (6a) zum Bestimmen der Durchführbarkeit bzw. Undurchführbarkeit der Bilderzeugungsart, die in der in der Einsetzvorrichtung (1) eingesetzten externen Speichereinrichtung (8) gespeichert ist, und

eine Warneinrichtung (6b) zum Warnen über das Bestimmungsergebnis aus der Bestimmungseinrichtung (6a).

2. Bilderzeugungsgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** die externe Speichereinrichtung (8) eine Vielzahl von in der externen Speichereinrichtung (8) gespeicherten Bilderzeugungsarten speichern kann, und daß Auswähleinrichtungen (6c) zum Auswählen einer gewünschten Bilderzeugungsart aus einer Vielzahl von in der externen Speichereinrichtung (8) gespeicherten Bilderzeugungsarten vorgesehen sind, wobei die Bestimmungseinrichtung (6a) die Durchführbarkeit bzw. Undurchführbarkeit der durch die Auswähleinrichtung (6c) eingestellten Bilderzeugungsart auf der Grundlage der ausgewählten Bilderzeugungsart und des Vorhandenseins der für die ausgewählte Bilderzeugungsart erforderlichen Gerätefunktionen bestimmt.

3. Bilderzeugungsgerät nach Anspruch 1, **dadurch gekennzeichnet, daß** die Warneinrichtung (6b) zum Anzeigen einer Meldung vorgesehen ist, die eine Durchführbarkeit bzw. Undurchführbarkeit entsprechend dem Bestimmungsergebnis anzeigt.

4. Bilderzeugungsgerät nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die externe Speichereinrichtung (8) eine Chipkarte (8) ist.

5. Bilderzeugungsgerät, von dem eine eine Vielzahl von Bilderzeugungsarten speichernde externe Speichereinrichtung beliebig abnehmbar ist, mit

einer Bilderzeugungsvorrichtung zum Erzeugen eines Bildes auf einem Aufzeichnungsmedium in einer gewünschten Bilderzeugungsart und

einer Einsetzvorrichtung zum Einsetzen der externen Speichereinrichtung,
gekennzeichnet durch

eine Erfassungseinrichtung (7) zum Erfassen des Einsetzens der externen Speichereinrichtung (8) in die Einsetzvorrichtung (1),

einer Auswähleinrichtung (133, 134), die zum manuellen Auswählen einer gewünschten Bilderzeugungsart von einer Vielzahl von in der externen Speichereinrichtung (8) gespeicherten Bilderzeugungsarten vorgesehen ist, sowie

eine Steuereinrichtung (6c) zum Auswählen und Einstellen einer vorbestimmten Bilderzeugungsart von einer Vielzahl von in der externen Speichereinrichtung (8) gespeicherten Bilderzeugungsarten entsprechend einem Erfassungs-Ausgangssignal aus der Erfassungseinrichtung (7).

6. Bilderzeugungsgerät nach Anspruch 5, **dadurch gekennzeichnet, daß** die externe Speichereinrichtung (8) eine Chipkarte (8) ist.

7. Bilderzeugungsgerät nach Anspruch 5, **gekennzeichnet durch** Auswähleinrichtungen (129, 133, 134; 611, 612, 619a) zum Auswählen einer von einer Eintrags-Betriebsart zum Verursachen, daß die externe Speichereinrichtung (8) eine durch die Eingabeeinrichtung (105 bis 117, 119, 120, 122 bis 126, 131; 601, 603, 607 bis 627, 630) eingegebene Bilderzeugungsart speichert, sowie einer Lese-Betriebsart zum Auslesen einer in der externen Speichereinrichtung (8) gespeicherten Bilderzeugungsart, und

eine Steuereinrichtung (6c) zum Auswählen der Lese-Betriebsart im Ansprechen auf die Erfassung des Einsetzens der externen Speichereinrichtung (8) durch die Erfassungseinrichtung (7).

8. Bilderzeugungsgerät nach Anspruch 5, **dadurch gekennzeichnet, daß** die Steuereinrichtung (6c) zum Auswählen und Einstellen der vorbestimmten Bilderzeugungsart auf Grundlage einer Eintrags-Geschichte der Bilderzeugungsart vorgesehen ist.

9. Bilderzeugungsgerät nach Anspruch 8, **dadurch gekennzeichnet, daß** die vorbestimmte Bilderzeugungsart die letzte eingetragene Bilderzeugungsart ist.

10. Bilderzeugungsgerät nach Anspruch 5, **dadurch gekennzeichnet, daß** die Steuereinrichtung (6c) zum Auswählen und Einstellen der vorbestimmten Bilderzeugungsart auf Grundlage einer Geschichte des Lesens der Bilderzeugungsart vorgesehen ist.

11. Bilderzeugungsgerät nach Anspruch 10, **dadurch gekennzeichnet, daß** die vorbestimmte Bilderzeugungsart die letzte ausgelesene Bilderzeugungsart ist.

Revendications

1. Appareil de formation d'images à partir duquel un moyen formant mémoire externe, stockant un mode de formation d'images, peut être détaché de manière arbitraire, comprenant

un moyen de formation d'images pour former une image sur un support d'enregistrement dans un mode souhaité de formation d'images, et

un moyen d'insertion pour insérer ledit moyen formant mémoire externe,

caractérisé par

un moyen de détermination (6a) pour déterminer la possibilité de réalisation/non réalisation du mode de formation d'images stocké dans ledit moyen (8) formant mémoire externe inséré dans ledit moyen d'insertion (1), et

un moyen d'avertissement (6b) pour avertir du résultat de la détermination provenant dudit moyen de détermination (6a).

2. Appareil selon la revendication 1, caractérisé en ce que ledit moyen (8) formant mémoire externe est agencé pour stocker une pluralité de modes de formation d'images stockés dans ledit moyen (8) formant mémoire externe, et en ce que des moyens de sélection (6c) sont utilisés pour sélectionner un mode souhaité de formation d'images à partir d'une pluralité de modes de formation d'images stockés dans ledit moyen (8) formant mémoire externe, dans lequel ledit moyen de détermination (6a) détermine la possibilité de réalisation/non réalisation dudit mode de formation d'images établi par ledit moyen de sélection (6c) sur la base dudit mode sélectionné de formation d'images et de la disponibilité des fonctions de l'appareil nécessitées par ledit mode sélectionné de formation d'images.

3. Appareil selon la revendication 1, caractérisé en ce que ledit moyen d'avertissement (6b) est agencé pour afficher un message indiquant la possibilité de réalisation/non réalisation en fonction du résultat de la détermination.

4. Appareil selon l'une quelconque des revendications 1 à 3, caractérisé en ce que ledit moyen (8) formant mémoire externe est une carte à circuit intégré (8).

5. Appareil de formation d'images à partir duquel un moyen formant mémoire externe, stockant une pluralité de modes de formation d'images, peut être détaché de manière arbitraire, comprenant

un moyen de formation d'images pour former une image sur un support d'enregistrement dans un mode souhaité de formation d'images, et

un moyen d'insertion pour insérer ledit moyen formant mémoire externe,

caractérisé par

un moyen de détection (7) pour détecter l'insertion dudit moyen (8) formant mémoire externe dans ledit moyen d'insertion (1),

un moyen de sélection (133, 134) agencé pour sélectionner manuellement un mode souhaité de formation d'images à partir d'une pluralité de modes de formation d'images stockés dans ledit moyen (8) formant mémoire externe, et

un moyen de commande (6c) pour sélectionner et établir un mode prédéterminé de formation d'images à partir d'une pluralité de modes de formation d'images stockés dans ledit moyen (8) formant mémoire externe en fonction d'une sortie de détection dudit moyen de détection (7).

6. Appareil selon la revendication 5, caractérisé en ce que ledit moyen (8) formant mémoire externe est une carte à circuit intégré (8).

7. Appareil selon la revendication 5, caractérisé en ce qu'il comprend en outre

des moyens de sélection (129, 133, 134; 611, 612, 619a) pour sélectionner l'un parmi un mode d'enregistrement pour conduire ledit moyen (8) formant mémoire externe à enregistrer un mode de formation d'images introduit par ledit moyen d'introduction (105 à 117, 119, 120, 122 à 126, 131; 601, 603, 607 à 627, 630) et un mode de lecture pour lire un mode de formation d'images enregistré dans ledit moyen (8) formant mémoire externe, et

un moyen de commande (6c) pour sélectionner le mode de lecture en réponse à la détection de l'insertion dudit moyen (8) formant mémoire externe par ledit moyen de détection (7).

8. Appareil de formation d'images selon la revendication 5, caractérisé en ce que ledit moyen de commande (6) est agencé pour sélectionner et établir le mode prédéterminé de formation d'images sur la base de l'historique de l'enregistrement du mode de formation d'images.

9. Appareil de formation d'images selon la revendication 8, caractérisé en ce que ledit mode prédéterminé de formation d'images est le dernier mode enregistré de formation d'images.

10. Appareil de formation d'images selon la revendication 5, caractérisé en ce que ledit moyen de commande (6c) est agencé pour sélectionner et établir le mode prédéterminé de formation d'images sur la base de l'historique de la lecture du mode de formation d'images.

11. Appareil de formation d'images selon la revendi-

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cation 10, caractérisé en ce que ledit mode prédéterminé de formation d'images est le dernier mode lu de formation d'images.