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SHEET CHARACTERISTIC DETECTION APPARATUS, IMAGE FORMING SYSTEM, AND RECORDING MEDIUM

Abstract

A sheet characteristic detection apparatus includes a first characteristic detector that is arranged on a conveyance path of a sheet and detects first characteristic information corresponding to a first characteristic of the sheet, and a second characteristic detector that is arranged on the conveyance path and detects second characteristic information corresponding to a second characteristic of the sheet, in which, on the basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector is controlled.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The entire disclosure of Japanese Patent Application No. 2024-020984 filed on Feb. 15, 2024 is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

TECHNICAL FIELD

[0002] The present invention relates to a sheet characteristic detection apparatus, an image forming system, and a recording medium.

DESCRIPTION OF RELATED ART

[0003] In an image forming apparatus that forms an image on a sheet and outputs the sheet, various conditions (image forming conditions) related to an image forming operation, a conveyance operation of a recording medium, and the like are appropriately adjusted according to characteristics of the sheet on which the image is to be formed, whereby the recording medium is stably conveyed, so that a high-quality image can be formed. There are various types of sheets to be used, and therefore, there is a technique (for example, JP 2023-084232A) in which an image forming apparatus is provided with sensors for measuring physical properties of a sheet, the physical properties of the sheet to be conveyed are specified from measurement results by the sensors, and thus condition setting is performed. The physical properties of the sheet include the moisture content, electric resistance, stiffness, and the like of the sheet.

SUMMARY OF THE INVENTION

[0004] However, depending on characteristics of the sheet such as physical properties of the sheet, various problems may occur in measurement by the sensor. For example, in a case where the moisture content of the sheet is high, when a high voltage is applied to the sheet in order to measure the electric resistance of the sheet, the following problem may occur. Specifically, a leakage voltage is applied to an electric device in the apparatus via the sheet, and when the leakage voltage exceeds a withstand voltage, the electric device is damaged.

[0005] An object of the present invention is to provide a sheet characteristic detection apparatus, an image forming system, and a recording medium that can prevent a problem that occurs depending on characteristics of a sheet when the characteristics of the sheet are measured.

[0006] To achieve at least one of the abovementioned objects, according to an aspect of the present invention, a sheet characteristic detection apparatus reflecting one aspect of the present invention comprises: [0007] a first characteristic detector that is arranged on a conveyance path of a sheet and detects first characteristic information corresponding to a first characteristic of the sheet; and

[0008] a second characteristic detector that is arranged on the conveyance path and detects second characteristic information corresponding to a second characteristic of the sheet, [0009] in which, on a basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector is controlled.

[0010] To achieve at least one of the abovementioned objects, according to another aspect of the present invention, a recording medium reflecting one aspect of the present invention is a non-transitory recording medium storing a computer readable program for a computer of a sheet characteristic detection apparatus comprising: [0011] a first characteristic detector that is arranged on a conveyance path of a sheet and detects first characteristic information corresponding to a first characteristic of the sheet; and [0012] a second characteristic detector that is arranged on the conveyance path and detects second characteristic information corresponding to a second

characteristic of the sheet, [0013] the program causing a computer to perform: [0014] controlling, on a basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The advantages and features provided by one or more embodiments of the invention will become more fully understood from the detailed description given hereinafter and the appended drawings which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention, and wherein:

[0016] FIG. **1** is a diagram illustrating an overall configuration of an image forming system of the present embodiment;

[0017] FIG. **2** is a diagram illustrating a detailed configuration of a sheet characteristic detection apparatus;

[0018] FIG. **3** is a diagram illustrating an example of a schematic configuration of a moisture content sensor;

[0019] FIG. **4**A is a perspective view illustrating an example of a schematic configuration of a stiffness sensor;

[0020] FIG. **4**B is a side view illustrating an example of a schematic configuration of the stiffness sensor;

[0021] FIG. **5** is a diagram illustrating an example of a schematic configuration of a resistance sensor;

[0022] FIG. **6** is a flowchart illustrating a control procedure for a detection control process;

[0023] FIG. **7** is a flowchart illustrating a control procedure for a detection control process of modification example 1;

[0024] FIG. **8** is a flowchart illustrating a control procedure for a detection control process of modification example 2;

[0025] FIG. **9** is a diagram illustrating a correspondence between a moisture content of a sheet and an applied voltage of modification example 2;

[0026] FIG. **10** is a diagram illustrating a correspondence between a moisture content of a sheet and the number of times of measurement with a resistance sensor of modification example 2;

[0027] FIG. **11** is a flowchart illustrating a control procedure for a detection control process of modification example 3;

[0028] FIG. **12**A illustrates a schematic diagram of the sheet and a stiffness sensor before a first movement of a pressing member;

[0029] FIG. **12**B illustrates a schematic diagram of the sheet and the stiffness sensor after the first movement of the pressing member;

[0030] FIG. **13**A illustrates a schematic diagram of the sheet and the stiffness sensor before a second movement of the pressing member;

[0031] FIG. **13**B is a schematic diagram of the sheet and the stiffness sensor after the second movement of the pressing member; and

[0032] FIG. **14** is a flowchart illustrating a control procedure for a detection control process of modification example 4.

DETAILED DESCRIPTION

[0033] Hereinafter, embodiments of the present invention will be described with reference to the drawings. However, the scope of the invention is not limited to the disclosed embodiments or illustrated examples.

1. Configuration of Image Forming System

[0034] FIG. **1** is a diagram illustrates an overall configuration of an image forming system U according to the present embodiment.

[0035] The image forming system U includes a sheet feed apparatus **1**, a sheet characteristic detection apparatus **2**, an image forming apparatus **3**, and a post-processing apparatus **4**.

Sheet Feed Apparatus

[0036] The sheet feed apparatus **1** includes a plurality of sheet feed trays **11**. The sheet feed apparatus **1** sends a medium (sheet) on which an image is to be recorded one by one from any one selected and set from among of the sheet feed trays **11**.

Sheet Characteristic Detection Apparatus

[0037] The sheet characteristic detection apparatus **2** includes a plurality of sensors for measuring physical properties and the like of the sheet. The sheet characteristic detection apparatus **2** measures the sheet sent from the sheet feed apparatus **1** on its path with a plurality of sensors. The sheet characteristic detection apparatus **2** can specify the physical properties and the like (characteristic information) of the sheet on the basis of the measurement results. The characteristic information of the sheet may include characteristic values themselves of the sheet, or may include values indicating the characteristics such as a current and a voltage of a sensor corresponding to the characteristic values of the sheet. The sheet characteristic detection apparatus **2** may output the physical property values obtained by the measurement to the outside, for example, the image forming apparatus **3** as it is.

[0038] FIG. **2** is a block diagram of the sheet characteristic detection apparatus **2**. The sheet characteristic detection apparatus **2** includes a controller **21** (hardware processor), a storage **22**, a sheet thickness sensor **23**, a moisture content sensor **24**, a stiffness sensor **25**, a resistance sensor **26**, a conveyor **27**, a communicator **28**, and the like.

[0039] The controller **21** comprehensively controls the operation of the sheet characteristic detection apparatus **2**. The controller **21** includes a central processing unit (CPU), a random access memory (RAM), and the like. The CPU controls a measurement operation with each of the sensors (the sheet thickness sensor **23**, the moisture content sensor **24**, the stiffness sensor **25**, and the resistance sensor **26**) and a conveyance operation of the sheet with the conveyor **27**. The RAM temporarily stores a measurement result by each sensor and the like.

[0040] The storage **22** stores a control program of a measurement operation by each sensor, measurement setting data, and the like. The storage **22** includes a nonvolatile memory such as an HDD or a flash memory.

[0041] The conveyor **27** receives a sheet sent out from the sheet feed device **1** on the right side of FIG. **1**, and sends the sheet to the image forming apparatus **3** from the left side of FIG. **1** along a first conveyance path **27**M. A second conveyance path **27**S branches from the middle of the first conveyance path **27**S extending horizontally. A distal end of the second conveyance path **27**S is connected to a purge tray **271**.

[0042] On the first conveyance path **27**M, the sheet thickness sensor **23** is located on the upstream side, and the moisture content sensor **24** is located on the downstream side.

[0043] On the second conveyance path **27**S, the stiffness sensor **25** is located on the upstream side and the resistance sensor **26** is located on the downstream side.

[0044] The sheet thickness sensor **23** measures the sheet thickness of the sheet as the characteristic information of the sheet and outputs the measurement result.

[0045] The sheet thickness sensor **23** includes paired conveyance rollers in which at least one of the rollers is movable according to the thickness of the sheet that passes through a nip of the rollers, and a measurement unit that measures a distance between axes of the paired conveyance rollers. The measurement unit includes, for example, an actuator, an encoder, a light emitter, and a light receiver. An axial position of the movable driven roller is displaced according to the thickness of the sheet nipped by the paired conveyance rollers. The sheet thickness sensor **23** measures the sheet thickness of the sheet by measuring the height of the displaced axis.

[0046] The moisture content sensor **24** measures the characteristic information corresponding to the moisture content of the sheet and outputs the measurement result. In the present embodiment, the moisture content sensor that measures the moisture content of the sheet as the characteristic information of the sheet will be described as an example, but a moisture amount sensor that measures the amount of moisture contained in the sheet as the characteristic information of the sheet may be applied.
[0047] FIG. **3** is a schematic diagram illustrating a configuration of the moisture content sensor **24**.
[0048] As illustrated in FIG. **3**, the moisture content sensor **24** includes a first light emitter **241**, a second light emitter **242**, a light receiver **243**, lenses **244** and **245**, and the like.
[0049] The first light emitter **241** emits first near-infrared light (reference light) in a specific wavelength band toward a sheet P. Specific examples of the first light emitter **241** include a light emitting diode (LED). The first near-infrared light is light whose absorption percentage in the sheet P when being reflected off the sheet P is not dependent on the moisture content of the sheet P.
[0050] The light receiver **243** receives, via the lens **245**, the first near-infrared light emitted from the first light emitter **241** and reflected off the sheet P via the lens **244**.
[0051] Specific examples of the light receiver **243** include a charge-coupled device (CCD), and a complementary metal-oxide-semiconductor (CMOS) image sensor.
[0052] The second light emitter **242** emits second near-infrared light in a specific wavelength band toward the sheet P. Specific examples of the second light emitter **242** includes an LED. The second near-infrared light is light whose absorption percentage in the sheet P when being reflected off the sheet P varies according to the moisture content of the sheet P.
[0053] The light receiver **243** receives, via the lens **245**, the second near-infrared light emitted from the second light emitter **242** and reflected off the sheet P via the lens **244**.
[0054] The moisture content sensor **24** outputs the amount of the first near-infrared light and the amount of the second near-infrared light received by the light receiver **243** (characteristic information corresponding to the moisture content of the sheet) to the controller **21**.
[0055] The controller **21** calculates the moisture content of the sheet P on the basis of the ratio between the amount of received first near-infrared light and the amount of received second near-infrared light.
[0056] The configuration of the moisture content sensor **24** is not limited to the example illustrated in FIG. **3**. The moisture content sensor **24** may have any other configuration as long as it can measure the characteristic information corresponding to the moisture content of the sheet P.
[0057] The sheet thickness sensor **23** and the moisture content sensor **24** can measure the respective pieces of characteristic information while moving the sheets to be conveyed at the conveyance speed.
[0058] The stiffness sensor **25** measures the characteristic information corresponding to the stiffness of the sheet and outputs the measurement result. The stiffness of the sheet is an index indicating the resistance when the sheet is bent.
[0059] FIG. **4**A is a perspective view illustrating a configuration of the stiffness sensor **25**. FIG. **4**B is a side view illustrating the configuration of the stiffness sensor **25**.
[0060] The stiffness sensor **25** includes sheet holding rollers **251** that hold one end portion side of the sheet P, and a presser **252**. In the examples illustrated in FIGS. **4**A and **4**B, the sheet holding rollers **251** are also included in the conveyor **27** and also have a function of conveying the sheet P, but a separate member may be applied.
[0061] The presser **252** includes a pressing member **252***a*, a pressing force detector **252***b*, a support mechanism **252***c*, and a motor M**1**.
[0062] The pressing member **252***a* is a member formed in an elongated shape in the sheet width direction (Y-axis direction) so as to be able to contact the entire width of the sheet P conveyed in the sheet conveyance direction (Z-axis direction). The pressing member **252***a* presses the sheet P.
[0063] The pressing force detector **252***b* includes, for example, a pressure sensor, and detects a

pressing force from the sheet P when the pressing member **252***a* presses the sheet P.
[0064] The support mechanism **252***c* supports the pressing member **252***a* and the pressing force detector **252***b* so as to be movable in the X-axis direction.
[0065] The motor M**1** is a driving source for moving the pressing member **252***a* and the pressing force detector **252***b* in the X-axis direction via the support mechanism **252***c*. The motor M**1** includes, for example, a stepping motor.
[0066] A method of acquiring the stiffness of the sheet P will be described below.
[0067] As illustrated in FIGS. **4**A and **4**B, under the control of the controller **21**, the conveyor **27** stops a motor M**2** that drives the sheet holding rollers **251**, and stops the conveyance of the sheet P at a predetermined position on the second conveyance path **27**S. At this time, the sheet P is in a state of being nipped and held between the sheet holding rollers **251**. The sheet holding rollers **251** hold the sheet P at a position separated from an end portion Pa of the sheet P by a predetermined distance.
[0068] Next, the presser **252** uses the drive of the motor MI to cause the pressing member **252***a* to move in the X-axis positive direction. Thus, as illustrated in FIG. **4**B, the end portion Pa (free end) of the sheet P is pressed and bent by the pressing member **252***a*. At this time, a position at which the pressing member **252***a* starts to come into contact with the surface of the sheet P (the right side surface in FIG. **4**B) in a state where the sheet P is not bent is set as a home position of the pressing member **252***a* in the X-axis direction. The pressing force that is received from the sheet P when the sheet P is bent by a predetermined amount (for example, 3 mm) by the pressing member **252***a* from the home position is detected by the pressing force detector **252***b*.
[0069] The presser **252** presses the pressing member **252***a* against the sheet P at a position closer to the end portion Pa of the sheet P than a position at which the sheet P is held by the sheet holding rollers **251**, thereby pressing the sheet P. The amount of pressing and bending of the sheet P by the pressing member **252***a* can be grasped by the number of pulse signals input to the driver of the motor M**1**.
[0070] The stiffness sensor **25** outputs the pressing force that is detected by the pressing force detector **252***b* (characteristic information corresponding to the stiffness of the sheet) to the controller **21**. The controller **21** calculates the stiffness of the sheet on the basis on the pressure value of the pressing force.
[0071] FIGS. **4**A and **4**B each illustrate an example in which the pressing member **252***a* presses the sheet P from the right to the left, but the present invention is not limited thereto. The pressing member **252***a* may press the sheet P in a direction from left to right.
[0072] The resistance sensor **26** measures the characteristic information corresponding to the electric resistance (volume electric resistance) of the sheet and outputs the measurement result.
[0073] FIG. **5** is a schematic diagram illustrating a configuration of the resistance sensor **26**.
[0074] As illustrated in FIG. **5**, the resistance sensor **26** includes a sheet holding roller **261** that includes a pair of rollers for nipping the sheet P, and a high-voltage (HV) unit **262**. In the example illustrated in FIG. **5**, the sheet holding roller **261** is also included in the conveyor **27** and also have the function of conveying the sheet P, but a separate member may be applied.
[0075] The sheet holding roller **261** includes a detection roller **261***a* located on the left side of the drawing and an opposing roller **261***b* located on the right side of the drawing and grounded.
[0076] A method of acquiring the electric resistance of the sheet P will be described below.
[0077] As illustrated in FIG. **5**, under the control of the controller **21**, the conveyor **27** stops a motor M**3** that drives the sheet holding roller **261**, and temporarily stops the sheet P at a predetermined position on the second conveyance path **27**S. At this time, the sheet P is in a state of being nipped and held by the sheet holding roller **261**. In this state, the resistance sensor **26** applies a high voltage to the detection roller **261***a* with the HV unit **262** and measures the value of a current flowing through the opposing roller **261***b* via the sheet P. The resistance sensor **26** outputs the measured current value (characteristic information corresponding to the electric resistance of the

sheet) to the controller **21**. The controller **21** calculates the electric resistance of the sheet by dividing the voltage applied to the detection roller **261***a* by the HV unit **262** by the current value measured by the resistance sensor **26**.
[0078] Alternatively, for one sheet, the characteristic information corresponding to the electric resistance of the sheet may be measured a plurality of times by the resistance sensor **26** to calculate the electric resistance of the sheet.
[0079] In this case, as described above, the resistance sensor **26** applies a high voltage to the detection roller **261***a* with the HV unit **262** and performs the first measurement of the value of the current flowing through the opposing roller **261***b* via the sheet P nipped by the sheet holding roller **261**. Next, the resistance sensor **26** outputs the current value measured at the first time to the controller **21**.
[0080] Next, under the control of the controller **21**, the conveyor **27** conveys the sheet P so that the sheet P is held by the sheet holding roller **261** at a position other than the position where the sheet P has been held by the sheet holding roller **261** in the first measurement of the current value, and temporarily stops. In this state, the resistance sensor **26** applies a high voltage to the detection roller **261***a* with the HV unit **262**, and performs the second measurement of the value of the current flowing to the opposing roller **261***b* via the sheet P nipped by the sheet holding roller **261**. Next, the resistance sensor **26** outputs the current value measured at the second time to the controller **21**. Hereinafter, similarly, the resistance sensor **26** measures the value of the current flowing through the opposing roller **261***b* via the sheet P a plurality of times.
[0081] Next, the controller **21** calculates the electric resistance of the sheet by dividing the voltage applied to the detection roller **261***a* by the HV unit **262** by an average value of the current values measured a plurality of times.
[0082] The stiffness sensor **25** and the resistance sensor **26** measure the respective pieces of characteristic information in a state where the conveyance of the sheet is temporarily stopped.
[0083] Under the control of the controller **21**, the conveyor **27** ejects the sheet for which the measurement by each sensor has been completed to the purge tray **271** without conveying the sheet to the image forming apparatus **3**.
[0084] In the image forming system U, the communicator **28** controls communication between the sheet characteristic detection apparatus **2** and the sheet feed apparatus **1**, the image forming apparatus **3**, and the post-processing apparatus **4**.
[0085] The controller **21** outputs at least one of the sheet thickness, the moisture content, the stiffness, and the electric resistance of the sheet as the characteristics of the sheet to the image forming apparatus **3** via the communicator **28**.

Image Forming Apparatus

[0086] The image forming apparatus **3**, for example, forms the image of image data read from a document on a sheet and outputs the image. The image forming apparatus **3** forms the image on the sheet by an electrophotographic method on the basis of the image data received from an external device (not illustrated), and outputs the sheet. That is, the image forming apparatus **3** is a multifunction peripheral. The image forming apparatus **3** may be connected to an external device, for example, a PC via a local area network (LAN) or the like.
[0087] The image forming apparatus **3** includes a controller **301**, a document reader **302**, an operation acceptor **303**, a display **304**, an image former **305**, a storage (not illustrated), a communicator (not illustrated), and the like.
[0088] The controller **301** integrally controls the operation of the image forming apparatus **3**. The controller **301** includes a CPU, a RAM, and the like. The CPU performs various settings and operations related to image formation according to an operation signal input from the operation acceptor **303** or an instruction signal received by the communicator.
[0089] The document reader **302** reads the image of the document placed on a document plate or an auto document feeder (ADF). The document reader **302** scans and exposes the document by an

optical system of a scanning exposure device, and reads its reflected light by a line image sensor to obtain an image signal. Next, the image reader **302** performs processing such as A/D conversion, shading correction, and compression on the image signal to generate image data.

[0090] The operation acceptor **303** accepts an input operation from the outside by a user or the like. The operation acceptor **303** includes a touch screen provided on a screen of the display **304**, and various hard keys arranged around the screen of the display **304**. The operation acceptor **303** converts the accepted operation content into an operation signal corresponding to the content and outputs the operation signal to the controller **301**. The touch screen may be of, for example, any one of a pressure-sensitive type, an electrostatic type, an optical type, and the like.

[0091] The display **304** includes, for example, a color liquid crystal display, and displays various kinds of information on the basis of the control of the controller **301**.

[0092] The image former **305** applies and fixes a color material to the sheet on the basis of the image data to be formed.

[0093] The controller **301** determines image forming conditions in the image former **305** on the basis of at least any one of the sheet thickness, the moisture content, the stiffness, and the electric resistance of the sheet received from the sheet characteristic detection apparatus **2**. The image former **305** forms an image on the sheet on the basis of the image forming conditions.

[0094] The image former **305** includes four writers **31**, an intermediate transfer belt **32**, a secondary transfer roller **33**, a fixer **34**, and the like.

[0095] The four writers **31** are arranged in series (tandem) along the belt surface of the intermediate transfer belt **32**, and form images of respective colors of cyan (C), magenta (M), yellow (Y), and black (K). The writers **31** may have the same configuration among the colors. For example, the writer **31** includes an optical scanner **31***a*, a photoreceptor **31***b*, a developer **31***c*, a charger **31***d*, a cleaner **31***e*, and a primary transfer roller **31***f*.

[0096] In each of the writers **31**, the charger **31***d* uniformly charges the photoreceptor **31***b*. The optical scanner **31***a* emits a light beam on the basis of the original image data to scan and expose the charged photoreceptor **31***b*, thereby forming an electrostatic latent image. The developer **31***c* supplies a color material such as toner to the electrostatic latent image to develop the image, thereby forming the image on the photoreceptor **31***b*.

[0097] The four writers **31** sequentially transfer the respective images formed on the photoreceptors **31***b* onto the intermediate transfer belt **32** in a superimposed manner by the respective primary transfer rollers **31***f*. The writer **31** forms an image of each color on the intermediate transfer belt **32** by the transfer (primary transfer). The intermediate transfer belt **32** circulates while being wound around a plurality of rollers. After the primary transfer, the cleaner **31***e* removes the coloring material remaining on the photoreceptor **31***b*.

[0098] The image forming apparatus **3** causes the sheet to pass through the position of the secondary transfer roller **33** in accordance with timing at which the image on the circulating intermediate transfer belt **32** reaches the position of the secondary transfer roller **33**. The secondary transfer roller **33** includes a pair of rollers. One of the rollers is pressed against and contacts the intermediate transfer belt **32**, and the other of the rollers serves as one of a plurality of rollers around which the intermediate transfer belt **32** is wound. The image is transferred (secondary transfer) onto the sheet from the intermediate transfer belt **32** pressed and contacted by the secondary transfer roller **33**.

[0099] The sheet on which the image has been secondarily transferred is conveyed to the fixer **34** and is subjected to a fixing process. The fixer **34** includes a pair of fixing rollers that are in press-contact with each other and at least one of which is heatable. The fixing rollers fix the image onto the sheet by applying heat and pressure to the sheet passing between the fixing rollers.

[0100] In a case where images are formed on both sides of a sheet, the sheet having an image formed and fixed on one side is sent to a reverse path **36** and turned over. Thereafter, the sheet is returned to a position on the upstream side of the secondary transfer roller **33**. In a case where the

image formation is performed on only one side or in a case where the image formation on both sides is completed, the sheet is ejected from the fixer **34** to the post-processing apparatus **4**.

Post-Processing Apparatus

[0101] The post-processing apparatus **4** performs a post process on the sheet on which the image has been formed. The post process includes, for example, sorting, cutting, stapling, folding, and the like. The post-processing apparatus **4** ejects the post-processed sheet to an ejection tray E or the like.

2. Operation of Image Forming System

[0102] Next, operation of the image forming system U will be described.

[0103] FIG. **6** is a flowchart illustrating a control procedure for a detection control process to be executed by the controller **21** of the sheet characteristic detection apparatus **2**. The controller **21** executes the detection control process before start of the image forming operation.

[0104] In the present embodiment, the first characteristic of the sheet is the moisture content of the sheet, and the moisture content sensor **24** functions as a first characteristic detector. The second characteristic of the sheet is the electric resistance of the sheet, and the resistance sensor **26** functions as a second characteristic detector.

[0105] The controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector in the detection control process.

Detection Control Process

[0106] The controller **21** causes the sheet feed apparatus **1** to feed a first sheet from the tray that supplies sheets on which images are to be formed, and conveys the first sheet along the first conveyance path **27**M (step A**1**).

[0107] Next, the controller **21** acquires the characteristic information (first characteristic information) corresponding to the moisture content of the sheet from the moisture content sensor **24** of the sheet characteristic detection apparatus **2**. Next, the controller **21** calculates the moisture content of the sheet on the basis of the characteristic information, thereby acquiring the moisture content of the sheet (step A**2**).

[0108] Next, the controller **21** conveys the sheet to the second conveyance path **27**S (step A**3**).

[0109] Next, the controller **21** acquires the characteristic information corresponding to the stiffness of the sheet from the stiffness sensor **25**. The controller **21** calculates the stiffness of the sheet on the basis of the characteristic information, thereby acquiring the stiffness of the sheet (step A**4**).

[0110] Next, the controller **21** determines whether the moisture content of the sheet acquired in step A**2** is equal to or more than a predetermined first threshold (for example, 30%) (step A**5**). The first threshold is set in advance.

[0111] If the moisture content of the sheet is less than the first threshold (step A**5**; NO), the controller **21** acquires the characteristic information (second characteristic information) corresponding to the electric resistance of the sheet by the resistance sensor **26**. The controller **21** calculates the electric resistance of the sheet on the basis of the characteristic information, thereby acquiring the electric resistance of the sheet (step A**6**).

[0112] Next, the controller **21** conveys the sheet along the second conveyance path **27**S, ejects the sheet to the purge tray **271** (step A**7**), and ends the detection control process.

[0113] On the other hand, if the moisture content of the sheet is equal to or more than the first threshold (step A**5**; YES), the controller **21** shifts the detection control process to step A**7**.

[0114] That is, if the moisture content of the sheet is equal to or more than the first threshold, the controller **21** ejects the sheet without causing the resistance sensor **26** to perform measurement. In other words, the controller **21** controls not to perform the detection by the resistance sensor **26** (second characteristic detector) according to the detection result of the moisture content sensor **24** (first characteristic detector). In this case, the controller **21** ejects the sheet without causing the resistance sensor **26** (second characteristic detector) to perform the operation of stopping the sheet.

[0115] Thus, if the moisture content of the sheet is equal to or more than the first threshold, a high

voltage is not applied to the sheet by the resistance sensor **26**, thereby preventing an electric device in the sheet characteristic detection apparatus **2** from being damaged due to the leakage voltage applied to the electric device via the sheet.

3. Modification Examples

[0116] Although the present embodiment has been described above, the specific configuration is not limited to the above-described present embodiment and can be changed without departing from the scope of the invention. Hereinafter, modification examples of the present embodiment will be described. In the modification examples, components similar to those of the above-described embodiment are denoted by the same reference numerals, and description thereof will be omitted.

Modification Example 1

[0117] FIG. **7** illustrates a flowchart of a detection control process of modification example 1.

[0118] In modification example 1, the first characteristic of the sheet is the moisture content of the sheet, and the moisture content sensor **24** functions as the first characteristic detector. The second characteristic of the sheet is the electric resistance of the sheet, and the resistance sensor **26** functions as a second characteristic detector.

[0119] In the detection control process of modification example 1, the controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector.

Detection Control Process of Modification Example 1

[0120] The controller **21** executes steps B**1** to B**7** similar to steps A**1** to A**7** of the above-described embodiment.

[0121] If the moisture content of the sheet is equal to or more than the first threshold (step B**5**; YES), the controller **21** changes the measurement conditions of the characteristic information (second characteristic information) corresponding to the electric resistance of the sheet in the resistance sensor **26**. That is, the controller **21** changes the detection conditions in the resistance sensor **26** (second characteristic detector) according to the detection result of the moisture content sensor **24** (first characteristic detector). Next, the controller **21** acquires, from the resistance sensor **26**, the characteristic information corresponding to the electric resistance of the sheet measured under the changed measurement conditions. Next, the controller **21** acquires the electric resistance of the sheet by calculating the electric resistance of the sheet on the basis of the characteristic information (step B**8**), and shifts the detection control process to step B**7**.

[0122] In step B**8**, as the change of the measurement conditions, for example, the controller **21** decreases the voltage to be applied to the detection roller **261***a* by the HV unit **262** from 2000 V to 1000 V.

Modification Example 2

[0123] FIG. **8** illustrates a flowchart of a detection control process of modification example 2.

[0124] In modification example 2, the first characteristic of the sheet is the moisture content of the sheet, and the moisture content sensor **24** functions as the first characteristic detector. The second characteristic of the sheet is the electric resistance of the sheet, and the resistance sensor **26** functions as a second characteristic detector.

[0125] In the detection control process of modification example 2, the controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector.

Detection Control Process of Modification Example 2

[0126] The controller **21** executes steps C**1** to C**4** similar to steps A**1** to A**4** of the above-described embodiment.

[0127] Next, the controller **21** determines whether the moisture content of the sheet acquired in step C**2** is equal to or more than a predetermined second threshold (for example, 50%) (step C**5**). The second threshold is set in advance.

[0128] If the moisture content of the sheet is less than the second threshold (step C**5**; NO), the controller **21** changes the measurement conditions of the characteristic information (second characteristic information) corresponding to the electric resistance of the sheet in the resistance

sensor **26** according to the moisture content of the sheet acquired in step C**2**. Next, the controller **21** acquires, from the resistance sensor **26**, the characteristic information corresponding to the electric resistance of the sheet measured under the changed measurement conditions. Next, the controller **21** calculates the electric resistance of the sheet on the basis of the characteristic information, thereby acquiring the electric resistance of the sheet (step C**6**).

[0129] In step C**6**, as the change in the measurement conditions, the controller **21** decreases the voltage to be applied to the detection roller **261***a* by the HV unit **262** as the moisture content of the sheet increases. That is, the controller **21** decreases the voltage to be applied to the sheet when detecting the characteristic information corresponding to the electric resistance with the resistance sensor **26** (second characteristic detector) as the moisture content (amount of moisture) of the sheet increases.

[0130] FIG. **9** illustrates a correspondence between the moisture content of the sheet and the voltage (applied voltage) applied to the detection roller **261***a* by the HV unit **262**.

[0131] Alternatively, in step C**6**, the resistance sensor **26** may measure the characteristic information corresponding to the electric resistance of the sheet a plurality of times for one sheet. In this case, as the change of the measurement conditions, the controller **21** decreases the number of times of measurement by the resistance sensor **26** for one sheet as the moisture content of the sheet increases. That is, the controller **21** decreases the number of times of detection of the characteristic information corresponding to the electric resistance with the resistance sensor **26** (second characteristic detector) as the moisture content (amount of moisture) of the sheet increases.

[0132] FIG. **10** illustrates a correspondence between the moisture content of the sheet and the number of times of measurement with the resistance sensor **26** for one sheet.

[0133] Next, the controller **21** conveys the sheet along the second conveyance path **27**S, ejects the sheet to the purge tray **271** (step C**7**), and ends the detection control process.

[0134] On the other hand, if the moisture content of the sheet is equal to or more than the second threshold (step C**5**; YES), the controller **21** shifts the detection control process to step C**7**.

[0135] That is, if the moisture content of the sheet is equal to or more than the second threshold, the controller **21** ejects the sheet without causing the resistance sensor **26** to perform measurement.

Modification Example 3

[0136] FIG. **11** illustrates a flowchart of a detection control process of modification example 3.

[0137] In modification example 3, the first characteristic of the sheet is the moisture content of the sheet, and the moisture content sensor **24** functions as the first characteristic detector. The second characteristic of the sheet is the stiffness of the sheet, and the stiffness sensor **25** functions as a second characteristic detector.

[0138] In the detection control process of modification example 3, the controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector.

Detection Control Process of Modification Example 3

[0139] The controller **21** executes steps D**1** to D**3** similar to steps A**1** to A**3** of the above-described embodiment. Next, the controller **21** determines whether the moisture content of the sheet acquired in step D**2** is equal to or less than a predetermined third threshold (for example, 3%) (step D**4**). The third threshold value is set in advance.

[0140] If the moisture content of the sheet is more than the third threshold (step D**4**; NO), the controller **21** acquires the characteristic information (second characteristic information) corresponding to the stiffness of the sheet from the stiffness sensor **25**. The controller **21** calculates the stiffness of the sheet on the basis of the characteristic information, thereby acquiring the stiffness of the sheet (step D**5**).

[0141] In step D**5**, the presser **252** uses the drive of the motor Ml to cause the pressing member **252***a* to move only once in the X-axis positive direction. The pressing force detector **252***b* detects the pressing force received from the sheet P at this time.

[0142] Next, the controller **21** executes steps D**6** and D**7** similar to steps A**6** and A**7** of the above-

described embodiment.
[0143] On the other hand, if the moisture content of the sheet is equal to or less than the third threshold (step D**4**; YES), the controller **21** changes the measurement conditions of the characteristic information corresponding to the stiffness of the sheet in the stiffness sensor **25**. Next, the controller **21** acquires, from the stiffness sensor **25**, the characteristic information corresponding to the stiffness of the sheet measured under the changed measurement conditions. Next, the controller **21** acquires the stiffness of the sheet by calculating the stiffness of the sheet on the basis of the characteristic information (step D**8**), and shifts the detection control process to step D**6**.
[0144] In step D**8**, the controller **21** moves the pressing member **252***a* twice in the X-axis positive direction as a change in the measurement conditions, and measures the pressing force received from the sheet P after the second movement with the pressing force detector **252***b*.
[0145] FIGS. **12**A to **13**B each illustrate an example in which the characteristic information corresponding to the stiffness of the sheet is measured by the stiffness sensor **25** when the moisture content of the sheet is equal to or less than the third threshold.
[0146] FIG. **12**A illustrates a schematic diagram of the sheet P and the stiffness sensor **25** before the first movement of the pressing member **252***a* in the X-axis positive direction.
[0147] If the moisture content of the sheet is equal to or less than the third threshold, the sheet P is charged by friction between the sheet P and the conveyance rollers during conveyance of the sheet P to the stiffness sensor **25**. Therefore, as illustrated in FIG. **12**A, when the sheet P is held by the sheet holding roller **251**, predetermined portions Pb of the sheet P adhere to the second conveyance path **27**S.
[0148] FIG. **12**B illustrates a state where, in this state, the pressing member **252***a* is moved in the X-axis positive direction and the sheet P is pressed by the pressing member **252***a*.
[0149] In this case, since the end portion Pa of the sheet P moves in a direction of an arrow indicated in FIG. **12**B, the pressing force detector **252***b* cannot accurately measure the pressing force received from the sheet P.
[0150] Thereafter, the stiffness sensor **25** returns the pressing member **252***a* to the original position.
[0151] As illustrated in FIG. **12**B, the electric charge of the sheet P is removed by the pressing member **252***a* contacting the sheet P. Therefore, as illustrated in FIG. **13**A, before the second movement of the pressing member **252***a* in the X-axis positive direction, the sheet P is not adhering to the second conveyance path **27**S.
[0152] Therefore, as illustrated in FIG. **13**B, after the second movement of the pressing member **252***a*, the pressing force detector **252***b* can accurately measure the pressing force received from the sheet P.
[0153] As described above, in step D**8**, the controller **21** changes the detection operation at the time of detecting the characteristic information corresponding to the stiffness with the stiffness sensor **25** (second characteristic detector) according to the moisture content (amount of moisture) of the sheet.
Modification Example 4
[0154] FIG. **15** illustrates a flowchart of a detection control process of modification example 4.
[0155] In modification example 4, the first characteristic of the sheet is the sheet thickness of the sheet, and the sheet thickness sensor **23** functions as a first characteristic detector. The second characteristic of the sheet is the moisture content of the sheet, and the moisture content sensor **24** functions as a second characteristic detector.
[0156] In the detection control process of modification example 4, the controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector.
Detection Control Process of Modification Example 4
[0157] The controller **21** executes step E**1** similar to step Al of the above-described embodiment.
[0158] Next, the controller **21** acquires the sheet thickness (first characteristic information) of the

sheet from the sheet thickness sensor **23** (step E**2**).
[0159] Next, the controller **21** determines whether the sheet thickness of the sheet acquired in step E**2** is equal to or less than a fourth predetermined threshold (step E**3**). The fourth threshold is set in advance.
[0160] When the sheet thickness of the sheet is more than the fourth threshold (step E**3**; NO), the controller **21** executes steps E**2** to E**6** similar to steps A**2**, A**3**, and A**7** of the above-described embodiment, and ends the detection control process. In this case, after step E**5**, the controller **21** may execute the same processes as steps A**5** and A**6** of the above-described embodiment.
[0161] On the other hand, if the sheet thickness of the sheet is equal to or less than the fourth threshold (step E**3**; YES), the controller **21** changes the measurement conditions of the characteristic information (second characteristic information) corresponding to the moisture content of the sheet in the moisture content sensor **24**. Next, the controller **21** acquires, from the moisture content sensor **24**, the characteristic information corresponding to the moisture content of the sheet measured under the changed measurement conditions. Next, the controller **21** acquires the moisture content of the sheet by calculating the moisture content of the sheet on the basis of the characteristic information (step E**7**), and shifts the detection control process to step E**5**.
[0162] If the sheet thickness of the sheet is equal to or less than the fourth threshold, the sheet is likely to vibrate in the up-down direction (the Z-axis direction illustrated in FIG. **1**). In order to accurately measure the characteristic information corresponding to the moisture content of the sheet, it is necessary to perform the measurement at the timing when the vibration ends.
[0163] Therefore, in step E**7**, the controller **21** controls the moisture content sensor **24** so that the timing of measuring the characteristic information corresponding to the moisture content of the sheet is later than the case where the sheet thickness of the sheet is more than the fourth threshold, as the change of the measurement conditions. That is, the controller **21** changes, according to the sheet thickness of the sheet, the detection conditions for detecting the characteristic information corresponding to the moisture content (amount of moisture) of the sheet by the moisture content sensor **24** (second characteristic detector).

Others

[0164] In the image forming system U according to each of the above-described embodiment and modification examples, the sheet characteristic detection apparatus **2** is arranged upstream of the image forming apparatus **3**, but the present invention is not limited thereto. The sheet characteristic detection apparatus **2** may be arranged downstream of the image forming apparatus **3**.
[0165] Also in this case, the controller **301** of the image forming apparatus **3** determines the image forming conditions on the basis of at least one of the sheet thickness, the moisture content, the stiffness, and the electric resistance of the sheet received from the sheet characteristic detection apparatus **2**.
[0166] In the detection control process according to each of the above-described embodiment and modification examples, the controller **21** controls the second characteristic detector on the basis of the detection result of the first characteristic detector, but the present invention is not limited thereto. The controller **21** may control the first characteristic detector on the basis of the detection result of the second characteristic detector.

4. Effect

[0167] As described above, the sheet characteristic detection apparatus **2** of the present embodiment includes the first characteristic detector that is arranged on the conveyance path of the sheet and detects the first characteristic information corresponding to the first characteristic of the sheet.
[0168] The sheet characteristic detection apparatus **2** of the present embodiment includes the second characteristic detector that is arranged on the conveyance path of the sheet and detects the second characteristic information corresponding to the second characteristic of the sheet.
[0169] In the sheet characteristic detection apparatus **2** of the present embodiment, on the basis of

the detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector is controlled.
[0170] Therefore, when the moisture content of the sheet is equal to or more than the predetermined value, it is possible not to perform the measurement with the resistance sensor **26** or to decrease the voltage to be applied to the sheet in the resistance sensor **26**. As a result, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected. That is, it is possible to prevent a problem that occurs depending on the characteristics of the sheet when the characteristics of the sheet are measured.
[0171] The sheet characteristic detection apparatus **2** of the present embodiment is arranged on the upstream side or the downstream side of the image former **305** that forms an image on a sheet.
[0172] Therefore, in both of the configuration in which the sheet characteristic detection apparatus **2** is arranged on the upstream side of the image forming apparatus **3** and the configuration in which the sheet characteristic detection apparatus **2** is arranged on the downstream side of the image forming apparatus **3**, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected.
[0173] The sheet characteristic detection apparatus **2** of the present embodiment is arranged on the upstream side of the image former **305**.
[0174] The image forming conditions in the image former **305** are determined on the basis of at least one of the first characteristic information and the second characteristic information.
[0175] Therefore, it is possible to form a high-quality image by stably conveying the sheet under the image forming conditions corresponding to the characteristics of the sheet.
[0176] In the sheet characteristic detection apparatus **2** of the present embodiment, the second characteristic detector is arranged on the downstream side of the first characteristic detector.
[0177] In the sheet characteristic detection apparatus **2** of the present embodiment, the second characteristic detector is controlled according to the detection result of the first characteristic detector.
[0178] In the sheet characteristic detection apparatus **2** of the present embodiment, the detection conditions in the second characteristic detector are changed according to the detection result of the first characteristic detector.
[0179] Therefore, when the moisture content of the sheet is equal to or more than the predetermined value, the voltage to be applied to the sheet in the resistance sensor **26** can be decreased. As a result, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected.
[0180] In the sheet characteristic detection apparatus **2** of the present embodiment, the second characteristic detector (resistance sensor **26**) is controlled not to perform detection according to the detection result of the first characteristic detector.
[0181] Therefore, when the moisture content of the sheet is equal to or more than a predetermined value, it is possible to perform control so that the measurement with the resistance sensor **26** is not performed. As a result, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected.
[0182] In the sheet characteristic detection apparatus **2** of the present embodiment, when the detection with the second characteristic detector is not performed, the sheet is ejected without causing the second characteristic detector to perform the operation of stopping the sheet.
[0183] In the sheet characteristic detection apparatus **2** of the present embodiment, the first characteristic and the second characteristic are different from each other.
[0184] In the sheet characteristic detection apparatus **2** of the present embodiment, the first characteristic information is information corresponding to the moisture content of the sheet, and the second characteristic information is information corresponding to the electric resistance of the sheet.
[0185] In the sheet characteristic detection apparatus **2** of the present embodiment, the voltage to be

applied to the sheet when information corresponding to the electric resistance is detected by the second characteristic detector (resistance sensor **26**) is decreased as the moisture amount (moisture content) of the sheet increases.

[0186] Therefore, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected.

[0187] In the sheet characteristic detection apparatus **2** of the present embodiment, the number of times of detection of the information corresponding to the electric resistance with the second characteristic detector is decreased as the moisture amount (moisture content) of the sheet is increased.

[0188] Therefore, it is possible to prevent a failure of the device due to a leakage voltage generated when the electric resistance of the sheet is detected.

[0189] In the sheet characteristic detection apparatus **2** of the present embodiment, the second characteristic detector is arranged on the downstream side of the first characteristic detector.

[0190] In the sheet characteristic detection apparatus **2** of the present embodiment, the first characteristic information is information corresponding to the moisture content of the sheet, and the second characteristic information is information corresponding to the stiffness of the sheet.

[0191] In the sheet characteristic detection apparatus **2** of the present embodiment, the detection operation at the time of detecting the information corresponding to the stiffness with the second characteristic detector (stiffness sensor **25**) is changed according to the moisture amount (moisture content) of the sheet.

[0192] Therefore, even in a case where the moisture content of the sheet is equal to or less than a predetermined value and the sheet is electrically charged and adheres to the second conveyance path **27**S, the stiffness of the sheet can be accurately detected.

[0193] In the sheet characteristic detection apparatus **2** of the present embodiment, the second characteristic detector is arranged on the downstream side of the first characteristic detector.

[0194] In the sheet characteristic detection apparatus **2** of the present embodiment, the first characteristic information is information corresponding to the sheet thickness of the sheet, and the second characteristic information is information corresponding to the moisture amount (moisture content) of the sheet.

[0195] In the sheet characteristic detection apparatus **2** of the present embodiment, the detection conditions when the information corresponding to the moisture content of the sheet is detected by the second characteristic detector (moisture content sensor **24**) are changed according to the sheet thickness of the sheet.

[0196] Therefore, even in a case where the sheet thickness of the sheet is equal to or less than a predetermined value and the sheet is likely to vibrate, the moisture content of the sheet can be accurately detected.

[0197] The sheet characteristic detection apparatus **2** of the present embodiment includes a controller **21** that controls, on the basis of the detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector.

[0198] The present invention is not limited to the above-described embodiment, and various modifications are possible.

[0199] For example, in the above-described embodiment, the controller **21** of the sheet characteristic detection apparatus **2** controls, on the basis of the detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector, but the present invention is not limited thereto. The controller **301** of the image forming apparatus **3** may control, on the basis of the detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector.

[0200] Although the controller **301** of the image forming apparatus **3** acquires at least one of the sheet thickness, the moisture content, the stiffness, and the electric resistance of the sheet from the sheet characteristic detection apparatus **2** to determine the image forming conditions of the image

former **305** in the above-described embodiment, the present invention is not limited thereto. The controller **21** of the sheet characteristic detection apparatus **2** may perform a process of determining the image forming conditions of the image former **305**. Alternatively, the image forming system U may have a control unit for determining the image forming conditions of the image former **305**, separately from the controller **301** of the image forming apparatus **3**.

[0201] In the image forming system U described above, the sheet characteristic detection apparatus **2** is independently located between the sheet feed apparatus **1** and the image forming apparatus **3**, but the present invention is not limited thereto. The sheet feed apparatus **1** or the image forming apparatus **3** may include the sheet thickness sensor **23**, the moisture content sensor **24**, the stiffness sensor **25**, and the resistance sensor **26**.

[0202] In the above description, the storage **22** including a non-volatile memory such as an HDD or a flash memory has been described as an example of a computer-readable medium that stores a program related to the setting control of the present invention, but the present invention is not limited thereto. As other computer-readable media, other non-volatile memories such as an MRAM and portable recording media such as a CD-ROM and a DVD disk can be applied. As a medium for providing data of the program according to the present invention via a communication line, a carrier wave is also applied to the present invention.

[0203] In addition, the specific configurations, the contents and procedures of the processing operations, and the like described in the above embodiment can be appropriately changed without departing from the spirit and scope of the present invention. It is intended that the scope of the present invention includes the scope of the invention described in the scope of the claims and the scope of equivalents thereof.

[0204] Although embodiments of the present invention have been described and shown in detail, the disclosed embodiments are made for purposes of illustration and example only and not limitation. The scope of the present invention should be interpreted by terms of the appended claims.

Claims

1. A sheet characteristic detection apparatus, comprising: a first characteristic detector that is arranged on a conveyance path of a sheet and detects first characteristic information corresponding to a first characteristic of the sheet; and a second characteristic detector that is arranged on the conveyance path and detects second characteristic information corresponding to a second characteristic of the sheet, wherein, on a basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector is controlled.

2. The sheet characteristic detection apparatus according to claim 1, wherein the sheet characteristic detection apparatus is arranged on an upstream side or a downstream side of an image former that forms an image on the sheet.

3. The sheet characteristic detection apparatus according to claim 2, wherein the sheet characteristic detection apparatus is arranged on the upstream side of the image former, and image forming conditions in the image former are determined on a basis of at least any one of the first characteristic information and the second characteristic information.

4. The sheet characteristic detection apparatus according to claim 1, wherein the second characteristic detector is arranged on a downstream side of the first characteristic detector, and the second characteristic detector is controlled according to a detection result of the first characteristic detector.

5. The sheet characteristic detection apparatus according to claim 4, wherein detection conditions in the second characteristic detector are changed according to a detection result of the first characteristic detector.

6. The sheet characteristic detection apparatus according to claim 4, wherein the second characteristic detector is controlled not to perform detection according to a detection result of the first characteristic detector.
7. The sheet characteristic detection apparatus according to claim 6, wherein in a case where the second characteristic detector does not perform the detection, the sheet is ejected without causing the second characteristic detector to perform an operation of stopping the sheet.
8. The sheet characteristic detection apparatus according to claim 1, wherein the first characteristic and the second characteristic are different from each other.
9. The sheet characteristic detection apparatus according to claim 1, wherein the first characteristic information is information corresponding to a moisture amount of the sheet, and the second characteristic information is information corresponding to an electric resistance of the sheet.
10. The sheet characteristic detection apparatus according to claim 9, wherein a voltage to be applied to the sheet when the second characteristic detector detects the information corresponding to the electric resistance is decreased as the moisture amount is increased.
11. The sheet characteristic detection apparatus according to claim 9, wherein the number of times of detection of the information corresponding to the electric resistance with the second characteristic detector is decreased as the moisture amount is increased.
12. The sheet characteristic detection apparatus according to claim 1, wherein the second characteristic detector is arranged on a downstream side of the first characteristic detector, the first characteristic information is information corresponding to a moisture amount of the sheet, and the second characteristic information is information corresponding to stiffness of the sheet.
13. The sheet characteristic detection apparatus according to claim 12, wherein a detection operation performed when the information corresponding to the stiffness is detected by the second characteristic detector is changed according to the moisture amount.
14. The sheet characteristic detection apparatus according to claim 1, wherein the second characteristic detector is arranged on a downstream side of the first characteristic detector, the first characteristic information is information corresponding to a sheet thickness of the sheet, and the second characteristic information is information corresponding to a moisture amount of the sheet.
15. The sheet characteristic detection apparatus according to claim 14, wherein detection conditions when the second characteristic detector detects the information corresponding to the moisture amount are changed according to the sheet thickness.
16. The sheet characteristic detection apparatus according to claim 1, further comprising a hardware processor that controls, on a basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector.
17. An image forming system, comprising: the sheet characteristic detection apparatus according to claim 1; and an image former that forms an image on the sheet.
18. A non-transitory recording medium storing a computer readable program for a computer of a sheet characteristic detection apparatus comprising: a first characteristic detector that is arranged on a conveyance path of a sheet and detects first characteristic information corresponding to a first characteristic of the sheet; and a second characteristic detector that is arranged on the conveyance path and detects second characteristic information corresponding to a second characteristic of the sheet, the program causing a computer to perform: controlling, on a basis of a detection result of any one of the first characteristic detector and the second characteristic detector, the other characteristic detector.