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(54) **IMAGE FORMING APPARATUS**

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CPC ***G03G 21/206*** (2013.01)

(57) **ABSTRACT**

An image forming apparatus includes an apparatus body, an image forming device to form an image on a recording medium, a casing to accommodate the image forming device, a sheet discharging port through which the recording medium having the image is discharged from the casing, a sheet stacker to stack the recording medium output through the sheet discharging port and opening on one side of the apparatus body and surrounded by outer walls including an outer wall having the sheet discharging port, an air guide opening disposed within a sheet passing range in a width direction of the recording medium in a sheet conveying path through which the recording medium having the image passes from the image forming device to the sheet discharging port, and an air suction fan to discharge air passing through the air guide opening to an outside of the casing.

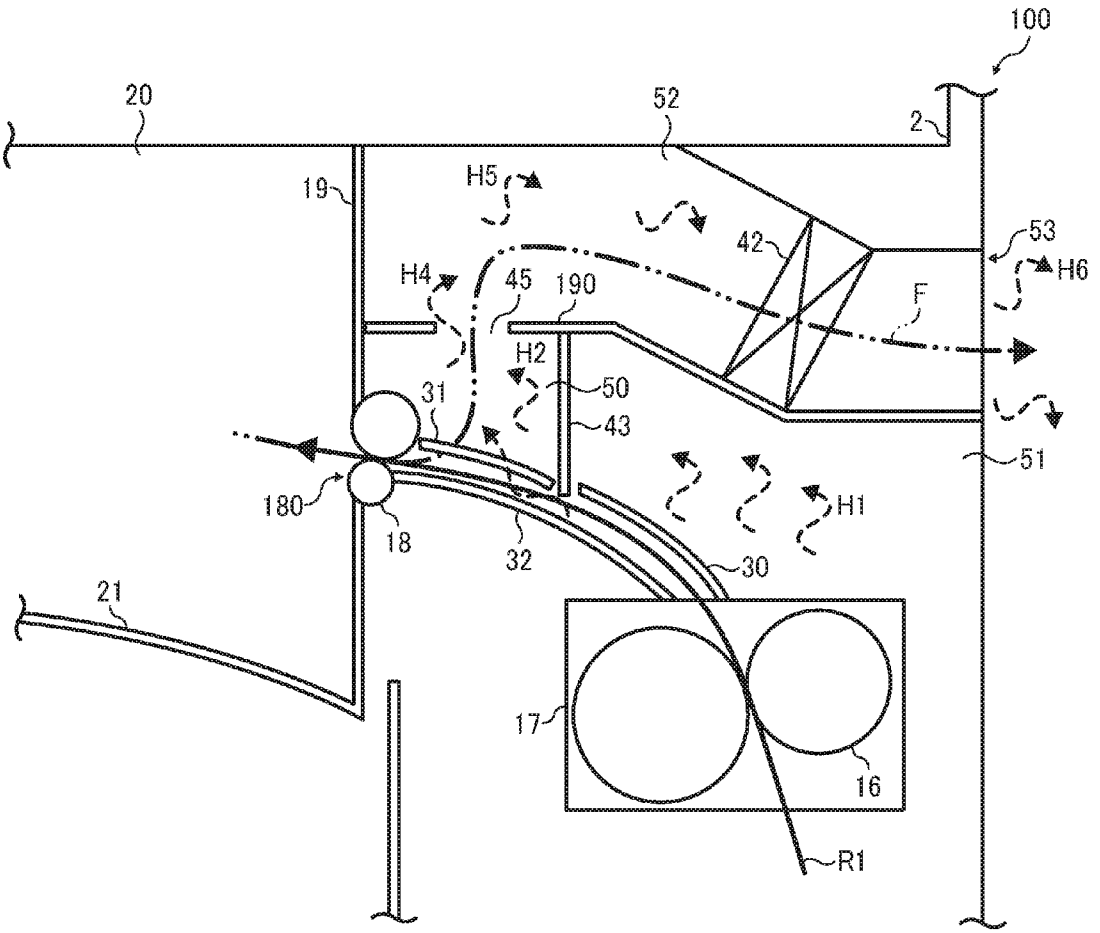
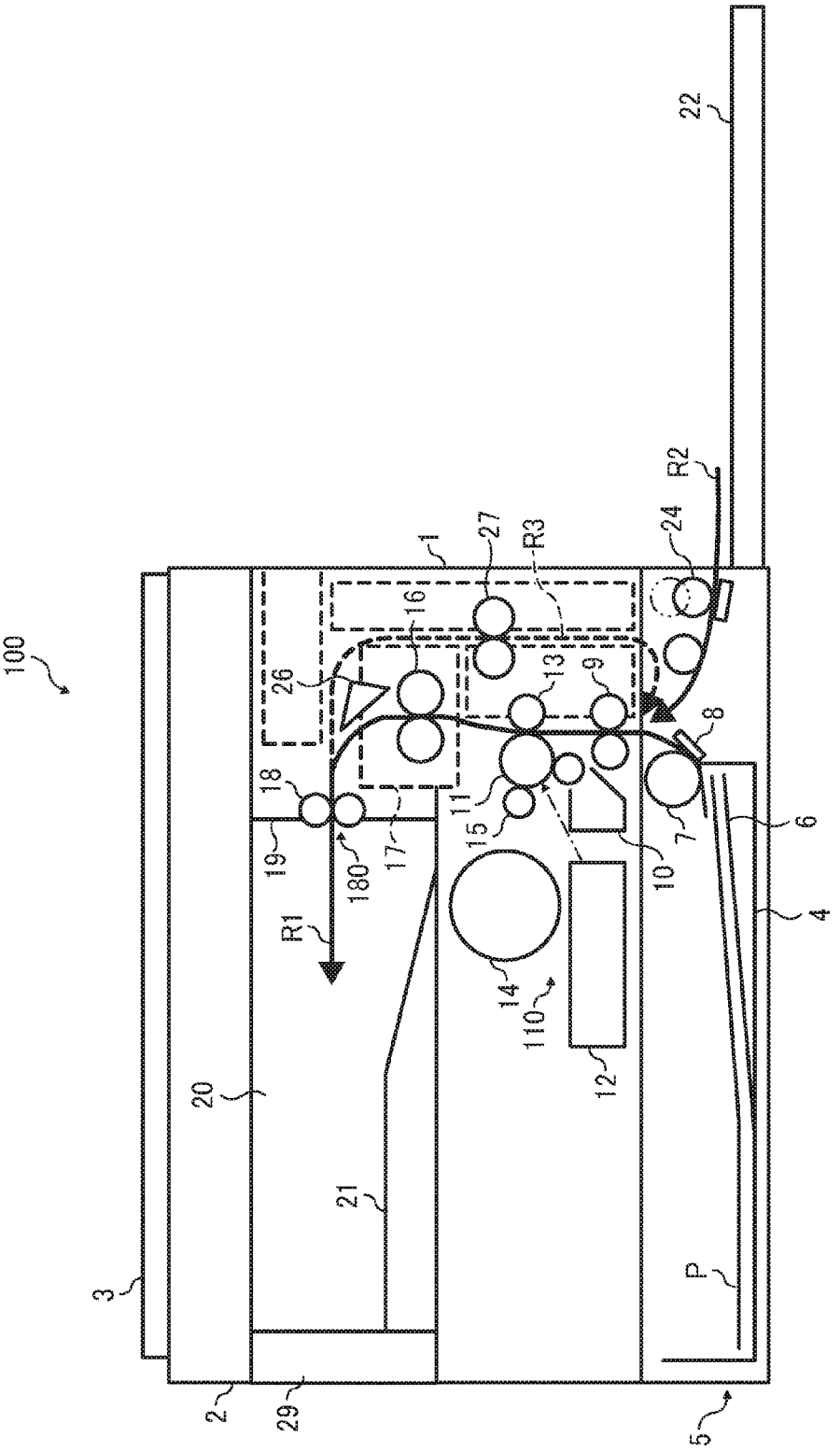


FIG. 1


100
1
2
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4
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10
11
12
13
14
15
16
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19
20
21
22
24
26
27
29
180
110
R1
R2
R3
P

FIG. 2

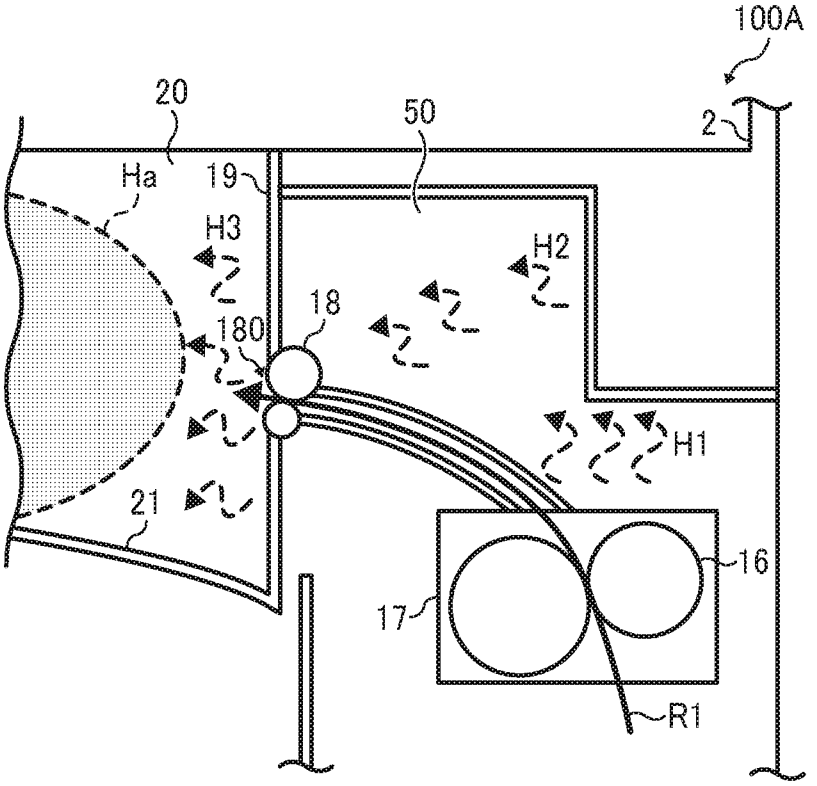


FIG. 3

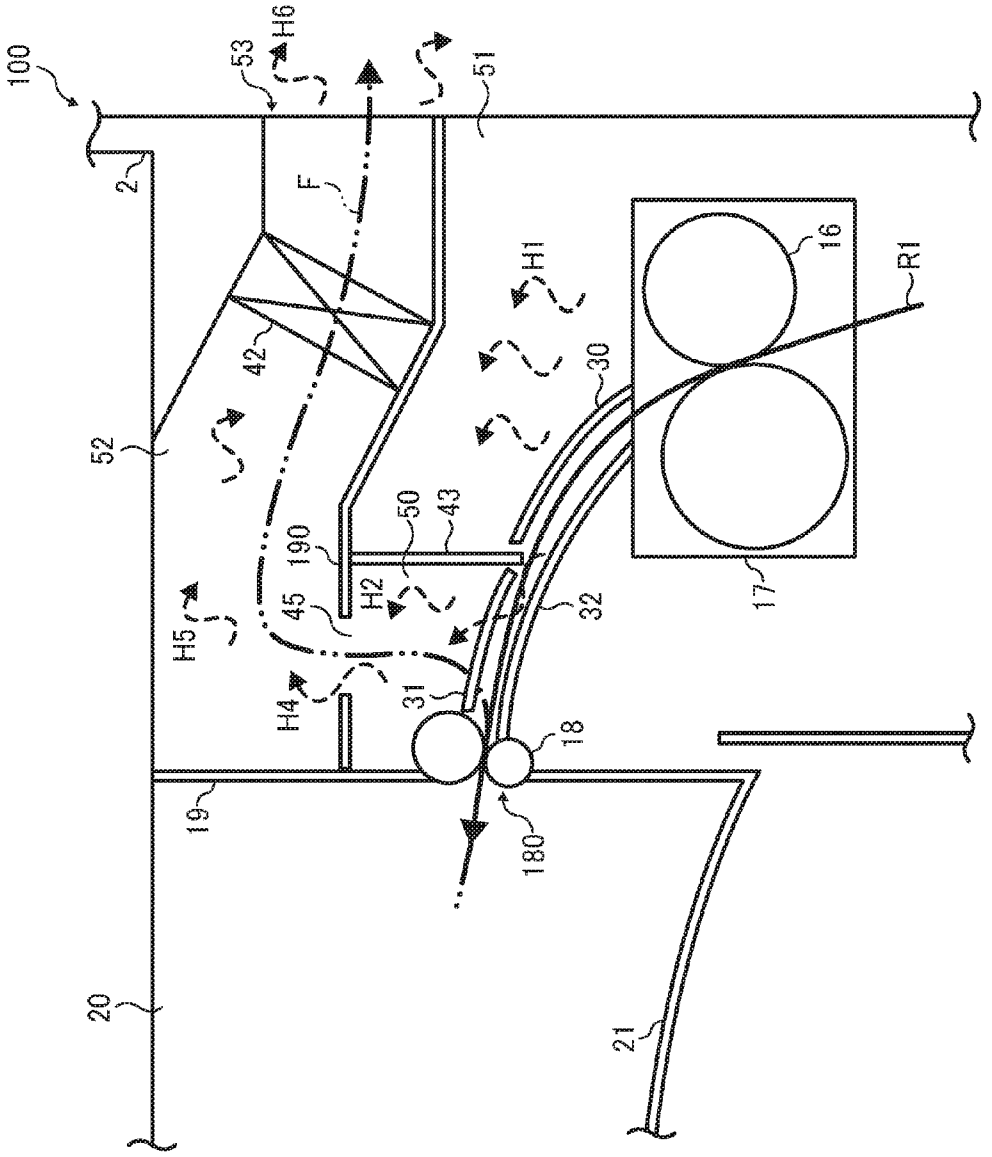

100
53
H6
51
2
F
H1
16
R1
42
30
52
50
43
190
H2
45
H5
32
17
H4
31
18
19
180
20
21

FIG. 4

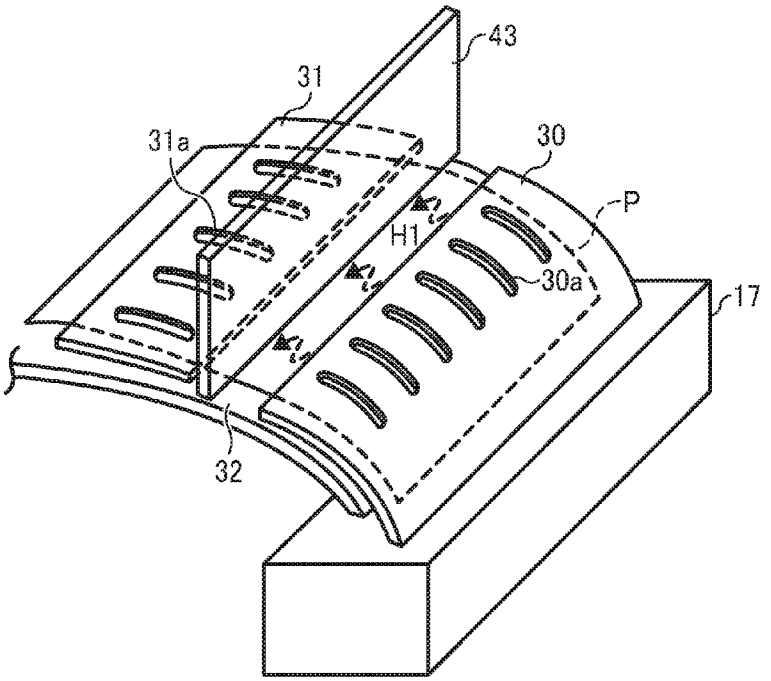


FIG. 5

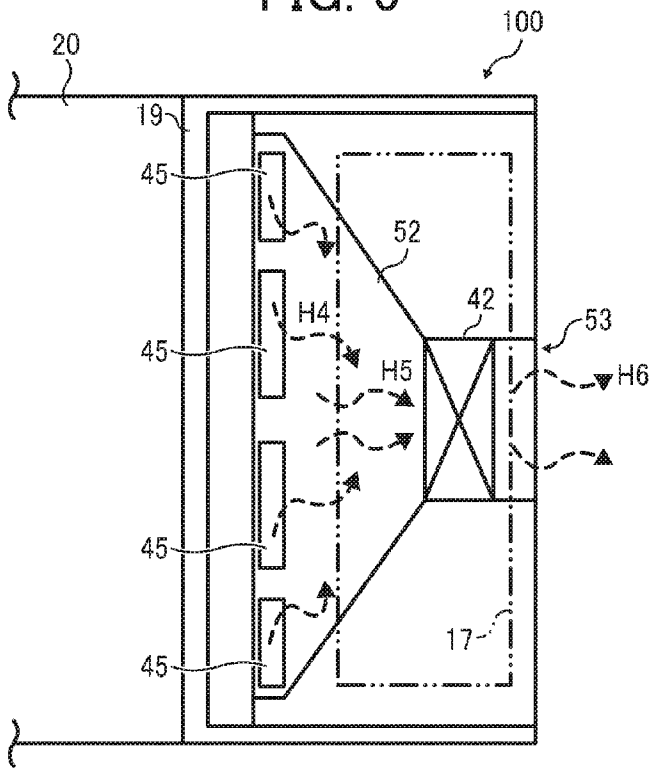


FIG. 6

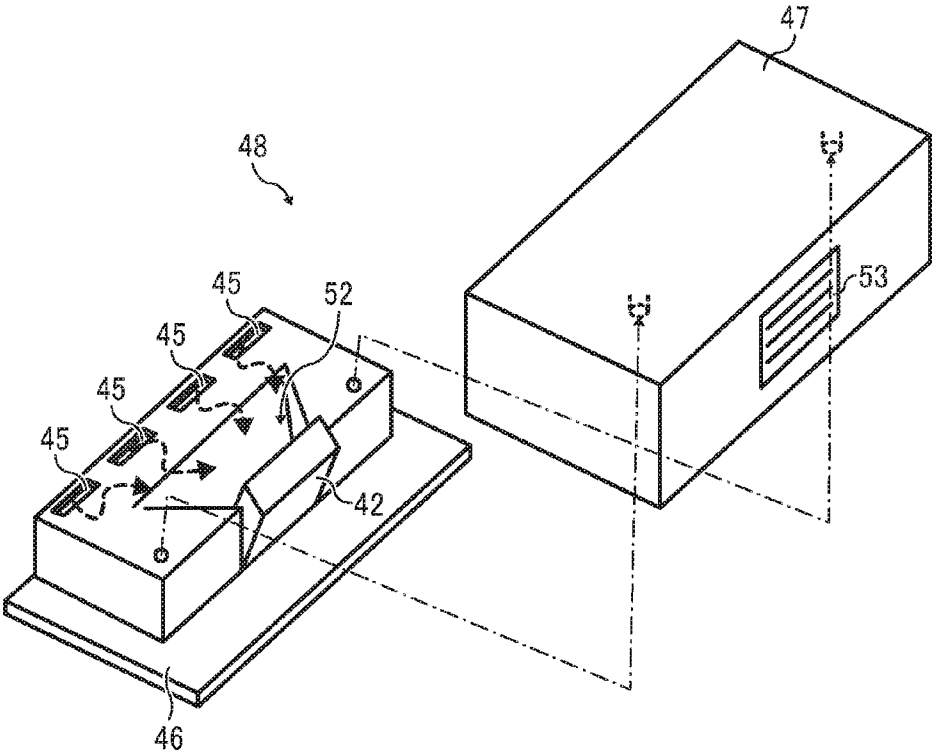
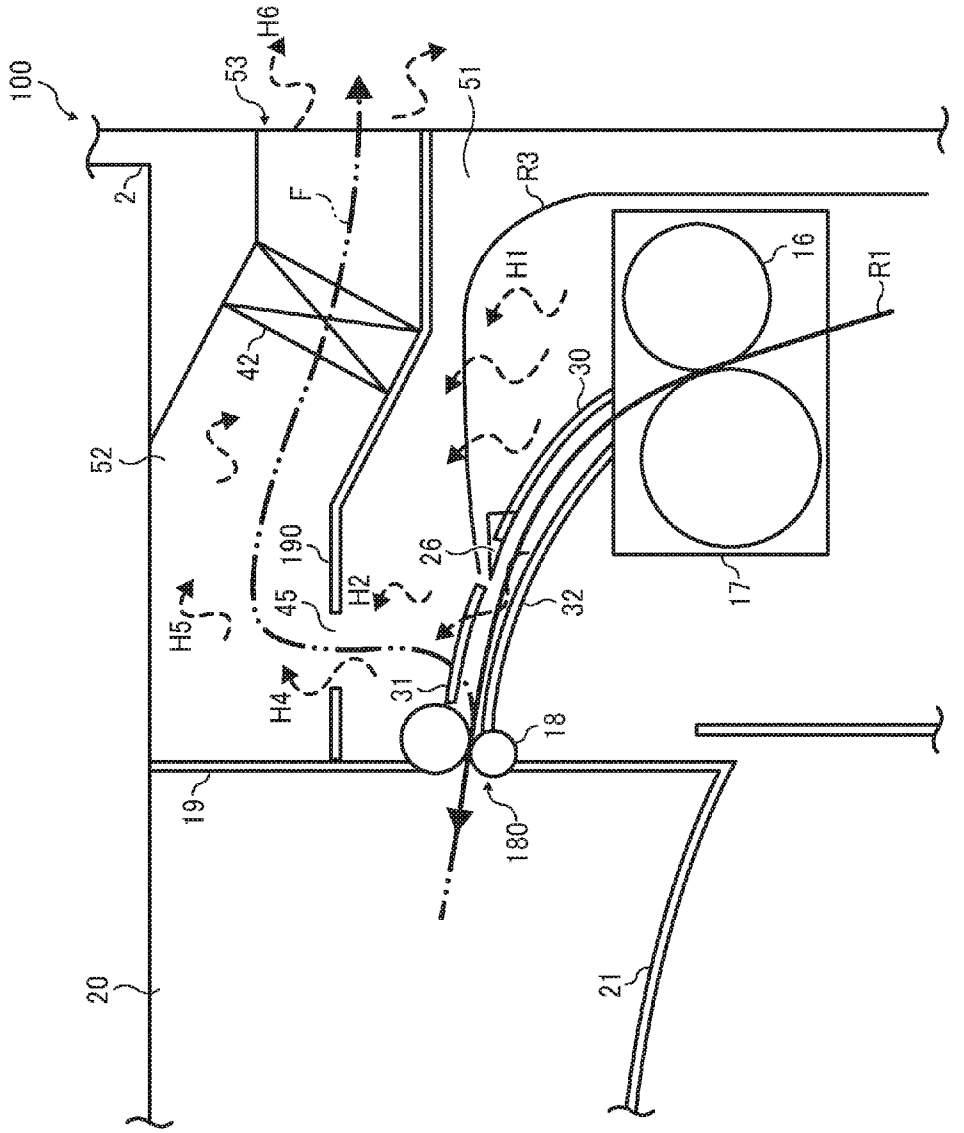


FIG. 7


100
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H6
51
2
F
R3
H1
16
R1
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30
52
190
26
H2
45
H5
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17
H4
31
18
19
180
20
21

FIG. 8

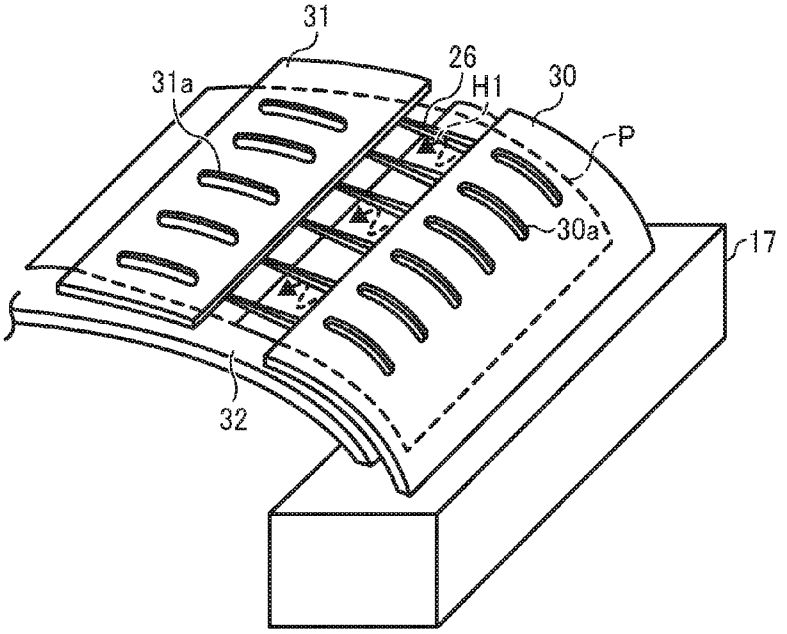


FIG. 9

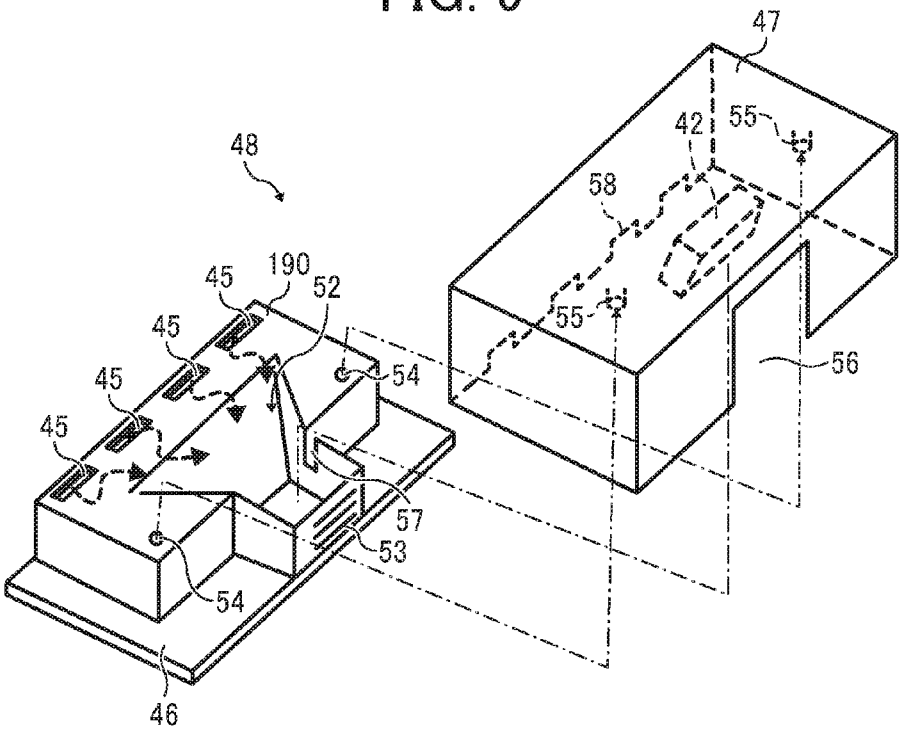
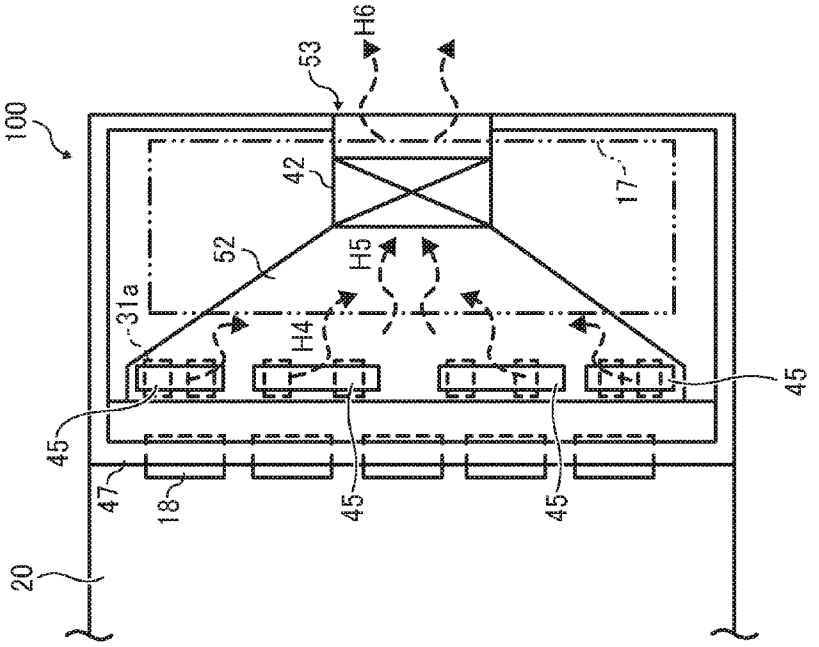


FIG. 11


100
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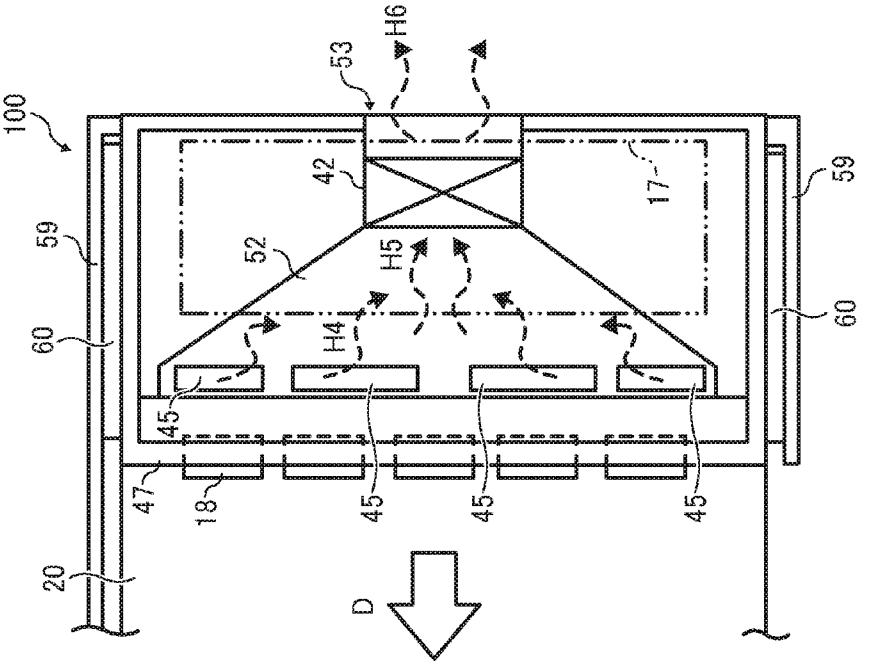
H6
42
17
52
H5
31a
H4
45
47
18
20

FIG. 10


100
53
H6
42
17
59
52
H5
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H4
45
47
18
20
D

IMAGE FORMING APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application is based on and claims priority pursuant to 35 U.S.C. §119(a) to Japanese Patent Application No. 2015-091979, filed on Apr. 28, 2015, in the Japan Patent Office, the entire disclosure of which is hereby incorporated by reference herein.

BACKGROUND

[0002] 1. Technical Field

[0003] This disclosure relates to an image forming apparatus.

[0004] 2. Related Art

[0005] A known electrophotographic image forming apparatus has a configuration in which an image forming device that is disposed in a housing forms an image on a recording medium and the recording medium is discharged through a sheet discharging port to a sheet discharging part that is disposed outside the housing. Such a known electrophotographic image forming apparatus employs an in-body output sheet stacking section arranged inside an apparatus body, which corresponds to the sheet discharging part.

[0006] For example, a known electrographic image forming apparatus that includes such an in-body output sheet stacking section includes an air drawing device on one side wall that is disposed outside a sheet width direction of a recording medium traveling in a sheet conveying path extending between a fixing unit and a sheet discharging port. The air drawing device draws air flowing in the sheet conveying path and discharges the air to an outside of the image forming apparatus.

SUMMARY

[0007] At least one aspect of this disclosure provides an image forming apparatus including an apparatus body, an image forming device, a casing, a sheet discharging port, a sheet stacker, an air guide opening, and an air suction fan. The image forming device is disposed in the apparatus body to form an image on a recording medium. The casing is provided to accommodate the image forming device. The sheet discharging port is an opening through which the recording medium having the image formed by the image forming device is discharged from the casing. The sheet stacker stacks the recording medium output through the sheet discharging port. The sheet stacker is surrounded by outer walls and opens on one side of the apparatus body. The outer walls includes an outer wall having the sheet discharging port. The air guide opening is disposed within a sheet passing range in a width direction of the recording medium in a sheet conveying path through which the recording medium having the image passes from the image forming device to the sheet discharging port. The air suction fan is disposed in the apparatus body to discharge air passing through the air guide opening to an outside of the casing.

[0008] Further, at least one aspect of this disclosure provides an image forming apparatus including a fixing device to fix an image formed on a recording medium to the recording medium, a sheet discharging rotary body to discharge the recording medium that has passed through the fixing device, a guide disposed between the fixing device and the sheet discharging rotary body to guide the recording medium to the sheet discharging rotary body and including multiple air guide openings within a range facing the recording medium, and an air suction fan disposed above the multiple air guide openings and discharging air drawn via the multiple air guide openings to an outside of an apparatus body.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0009] FIG. **1** is a schematic view illustrating an entire configuration of the image forming apparatus according to an embodiment of this disclosure;

[0010] FIG. **2** is a schematic enlarged view illustrating an area near a fixing unit and a sheet discharging port of a comparative image forming apparatus that discharges sheets to an in-body output sheet stacker;

[0011] FIG. **3** is a schematic enlarged view illustrating an area near a fixing unit and a sheet discharging port of an image forming apparatus according to an embodiment of this disclosure;

[0012] FIG. **4** is an enlarged perspective view illustrating an area near a sheet conveying path extending between the fixing unit and the sheet discharging port;

[0013] FIG. **5** is a schematic top view illustrating an air exhaust duct;

[0014] FIG. **6** is a diagram illustrating a configuration of a cooling unit in which a cooling mechanism including an air passage opening and an air suction fan is provided with an outer cover;

[0015] FIG. **7** is a schematic enlarged view illustrating an area near a fixing unit and a sheet discharging port of an image forming apparatus according to an embodiment of this disclosure;

[0016] FIG. **8** is an enlarged perspective view illustrating the area near the sheet conveying path extending between the fixing unit and the sheet discharging port of FIG. **7**;

[0017] FIG. **9** is a diagram illustrating a configuration of a cooling unit in which a cooling mechanism including an air passage opening and an air suction fan is provided with an outer cover;

[0018] FIG. **10** is a schematic top view illustrating the air exhaust duct; and

[0019] FIG. **11** is a schematic top view illustrating the air exhaust duct.

DETAILED DESCRIPTION

[0020] It will be understood that if an element or layer is referred to as being "on", "against", "connected to" or "coupled to" another element or layer, then it can be directly on, against, connected or coupled to the other element or layer, or intervening elements or layers may be present. In contrast, if an element is referred to as being "directly on", "directly connected to" or "directly coupled to" another element or layer, then there are no intervening elements or layers present. Like numbers referred to like elements throughout. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0021] Spatially relative terms, such as "beneath", "below", "lower", "above", "upper" and the like may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. It will be understood that the

spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements describes as "below" or "beneath" other elements or features would then be oriented "above" the other elements or features. Thus, term such as "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors herein interpreted accordingly.

[0022] Although the terms first, second, etc. may be used herein to describe various elements, components, regions, layers and/or sections, it should be understood that these elements, components, regions, layer and/or sections should not be limited by these terms. These terms are used to distinguish one element, component, region, layer or section from another region, layer or section. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the present disclosure.

[0023] The terminology used herein is for describing particular embodiments and examples and is not intended to be limiting of exemplary embodiments of this disclosure. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "includes" and/or "including", when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0024] Descriptions are given, with reference to the accompanying drawings, of examples, exemplary embodiments, modification of exemplary embodiments, etc., of an image forming apparatus according to exemplary embodiments of this disclosure. Elements having the same functions and shapes are denoted by the same reference numerals throughout the specification and redundant descriptions are omitted. Elements that do not demand descriptions may be omitted from the drawings as a matter of convenience. Reference numerals of elements extracted from the patent publications are in parentheses so as to be distinguished from those of exemplary embodiments of this disclosure.

[0025] This disclosure is applicable to any image forming apparatus, and is implemented in the most effective manner in an electrophotographic image forming apparatus.

[0026] In describing preferred embodiments illustrated in the drawings, specific terminology is employed for the sake of clarity. However, the disclosure of this disclosure is not intended to be limited to the specific terminology so selected and it is to be understood that each specific element includes any and all technical equivalents that have the same function, operate in a similar manner, and achieve a similar result.

[0027] Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, preferred embodiments of this disclosure are described.

[0028] Now, a description is given of an electrophotographic image forming apparatus **100** for forming images by electrophotography. It is to be noted that, hereinafter, the electrophotographic image forming apparatus **100** is referred to as the image forming apparatus **100**. In the present embodiment, the image forming apparatus **100** is a monochrome image forming apparatus. However, the configuration is not limited thereto. For example, this disclosure can be also applied to a known image forming apparatus. It is also to be noted that, while the image forming apparatus **100** according to the present embodiment is a compact and desktop-type image forming apparatus, a relatively large image forming apparatus that is installed on the floor can also be applied to this disclosure.

[0029] A description is given of a configuration of the image forming apparatus **100** according to an embodiment of this disclosure, with reference to FIG. **1**.

[0030] It is to be noted that identical parts are given identical reference numerals and redundant descriptions are summarized or omitted accordingly.

[0031] The image forming apparatus **100** may be a copier, a facsimile machine, a printer, a multifunction peripheral or a multifunction printer (MFP) having at least one of copying, printing, scanning, facsimile, and plotter functions, or the like. According to the present example, the image forming apparatus **100** is an electrophotographic copier that forms toner images on recording media by electrophotography.

[0032] It is to be noted in the following examples that: the term "image forming apparatus" indicates an apparatus in which an image is formed on a recording medium such as paper, OHP (overhead projector) transparencies, OHP film sheet, thread, fiber, fabric, leather, metal, plastic, glass, wood, and/or ceramic by attracting developer or ink thereto; the term "image formation" indicates an action for providing (i.e., printing) not only an image having meanings such as texts and figures on a recording medium but also an image having no meaning such as patterns on a recording medium; and the term "sheet" is not limited to indicate a paper material but also includes the above-described plastic material (e.g., a OHP sheet), a fabric sheet and so forth, and is used to which the developer or ink is attracted. In addition, the "sheet" is not limited to a flexible sheet but is applicable to a rigid plate-shaped sheet and a relatively thick sheet.

[0033] Further, size (dimension), material, shape, and relative positions used to describe each of the components and units are examples, and the scope of this disclosure is not limited thereto unless otherwise specified.

[0034] Further, it is to be noted in the following examples that: the term "sheet conveying direction" indicates a direction in which a recording medium travels from an upstream side of a sheet conveying path to a downstream side thereof; the term "width direction" indicates a direction basically perpendicular to the sheet conveying direction.

[0035] FIG. **1** is a schematic view illustrating an entire configuration of the image forming apparatus **100** according to an embodiment of this disclosure.

[0036] The image forming apparatus **100** includes an apparatus body **1**, a document reading device **2**, and a document pressing plate **3**. The apparatus body **1** is provided to perform image formation. The image forming apparatus **100** further includes a sheet feeder **5** that includes a sheet tray **4**. The sheet feeder **5** is disposed below the apparatus body **1**. The sheet tray **4** is detachably attachable to the image forming apparatus **100**. That is, the sheet tray **4** can be removed from the image forming apparatus **100** of FIG. **1** toward a front side direction of FIG. **1**.

[0037] The image forming apparatus **100** further includes a sheet conveying path indicated by arrow R**1** in FIG. **1**. A sheet P accommodated in the sheet tray **4** travels in the sheet conveying path R**1**. The sheet P that is accommodated and loaded in the sheet tray **4** has a leading edge, which is located to the right side in FIG. **1**. A movable bottom plate **6** pushes up the leading edge of the sheet P. Then, a sheet feed roller **7** in rotation applies a sheet conveying force in an upper right direction of FIG. **1**. A friction pad **8** separates the sheet P one by one from the other sheets P in the sheet tray **4**. The separated sheet P is conveyed to a pair of registration rollers **9** that includes two rollers disposed facing each other. The pair of registration rollers **9** in rotation adjusts a timing of movement of the sheet P while the sheet P is vertically conveyed up toward a transfer position where a toner image is transferred onto the sheet P.

[0038] While a drum-shaped photoconductor **11** is rotating, a charging roller **15** uniformly charges a surface of the photoconductor **11**. An optical writing unit **12** emits laser light to irradiate the surface of the photoconductor **11**, so that an electrostatic latent image is formed on the surface of the photoconductor **11**.

[0039] The electrostatic latent image is developed by a developing device **10** into a visible toner image. As the photoconductor **11** rotates, the toner image reaches the transfer position where the photoconductor **11** and a transfer roller **13** are disposed facing each other. Then, when the sheet P passes the transfer position, the toner image is formed on one side of the sheet P, which is the left side of FIG. **1**. The developing device **10** consumes toner contained therein by development of the toner image. Therefore, a toner bottle **14** is disposed above the optical writing unit **12** in FIG. **1**, so that the toner is supplied to the developing device **10**.

[0040] The sheet P having the visible toner image is conveyed to a fixing unit **17** that is disposed above the transfer position. The fixing unit **17** includes a pair of thermal fixing rollers **16** and a heater. The pair of thermal fixing rollers **16** that is heated by the heater applies heat and pressure to the sheet P, thereby fixing the toner image to the sheet P. The image forming apparatus **100** further includes a pair of sheet discharging rollers **18** that includes two rollers. The pair of sheet discharging rollers **18** discharges the sheet P that has passed through the fixing unit **17** to the outside of a casing **19** via a sheet discharging port **180**. The casing **19** is a housing that contains an image forming device **110** that performs image formation. The image forming device **110** includes a sheet charging roller **15**, the photoconductor **11**, the optical writing unit **12**, the developing device **10**, the transfer roller **13**, and the fixing unit **17**. An output sheet stacker **20** is disposed in an in-body sheet discharging space of the image forming apparatus **100**. Specifically, the output sheet stacker **20** includes a space that is located below the document reading device **2** and outside of the sheet discharging port **180** through which the sheet P is discharged from the casing **19**. The output sheet stacker **20** is surrounded and defined by walls. One wall out of the walls surrounding the output sheet stacker **20** includes the sheet discharging port **180**. The output sheet stacker **20** that is an in-body output sheet stacking section opens on one side surface of the apparatus body **1** of the image forming apparatus **100**. In other words, the output sheet stacker **20** is defined by the walls of the apparatus body **1** and the document reading device **2**. After passing through the sheet discharging port **180**, the sheet P is discharged to the output sheet stacker **20**. The sheet P discharged in the output sheet stacker **20** is placed on an output tray **21** with the image side facing down. The output tray **21** that receives discharged sheets P functions as a lower face of the output sheet stacker **20**.

[0041] The image forming apparatus **100** further includes a different sheet feeding section besides the sheet tray **4**. The different sheet feeding section is a bypass feeder that includes a bypass tray **22**. The bypass feeder feeds a sheet P placed on the bypass tray **22** that is rotatable to the right direction to open in FIG. **1**. The image forming apparatus **100** further includes a sheet conveying path indicated by arrow R**2** in FIG. **1**.

[0042] The sheet P placed in the bypass tray **22** travels in the sheet conveying path R**2**. As a sheet feed roller **24** rotates vertically, the sheet P placed in the bypass tray **22** is fed to the left side in FIG. **1** to be guided by the pair of registration rollers **9**. Then, the sheet P meets the sheet conveying path R**1**. Thereafter, the sheet P is conveyed in the same manner when the sheet P that is accommodated in the sheet tray **4**.

[0043] As described above, the single-side printing is performed in the image forming apparatus **100**.

[0044] Next, a description is given of a route and operations of the sheet P in duplex printing in the image forming apparatus **100**.

[0045] The image forming apparatus **100** further includes a sheet reverse path indicated by a broken arrow R**3** in FIG. **1**. A sheet P for duplex printing travels in the sheet reverse path R**3** after an image is formed on one side of the sheet P.

[0046] Similar to the single-side printing described above, the sheet P having an image on one side is output to expose half on the leading edge side while being held between the rollers of the pair of sheet discharging rollers **18**. Then, the sheet P is stopped at a point where the trailing edge of the sheet P has passed the leading edge of a reverse path switching claw **26**. In this case, when the trailing edge of the sheet P passes the leading edge of the reverse path switching claw **26**, the sheet P moves to a higher position than the leading edge of the reverse path switching claw **26** due to stiffness of the sheet P. Here, when the pair of sheet discharging rollers **18** is reversely rotated, the sheet P passes over the reverse path switching claw **26** in the sheet reverse path R**3** as indicated by a broken arrow in FIG. **1**. Then, the sheet P is guided downwardly by a guide provided in the sheet reverse path R**3** to be conveyed further downwardly.

[0047] After passing between the pair of duplex conveyance rollers **27**, the sheet P is guided by the guide disposed in the sheet reverse path R**3** to be conveyed and turned as indicated by a broken arrow in FIG. **1**. Then, the sheet P is guided to the pair of registration rollers **9** again. Thus, an image is formed on the other side of the sheet P for duplex printing. The sheet P having images on both sides is discharged onto the output tray **21**.

[0048] A support pillar **29** that is a cylindrical member disposed on the left side of the output sheet stacker **20** in FIG. **1** is disposed on the front on the left side of FIG. **1** and functions as a support to support the document reading device **2**. The printed sheet P that is output to the output tray **21** is taken out constantly from the front that is a near side in FIG. **1**. In a case in which the sheet P cannot be removed from the front, the sheet P is taken out from the left side.

[0049] In the image forming apparatus **100** illustrated in FIG. **1**, when the image is fixed by application of heat and

pressure in the fixing unit **17**, the ambient temperature of the fixing unit **17** is heated while the sheet P is heated for fixing, and therefore the temperature of air around the fixing unit **17** is increased. Further, the image forming apparatus **100** illustrated in FIG. **1** includes the output tray **21** in an in-body output sheet stacking section of the apparatus body **1**. Therefore, an installation space of the electrophotographic image forming apparatus **100** can be reduced. In such the image forming apparatus (e.g., the image forming apparatus **100**), the sheet (e.g., the sheet P) having an image on one side or two images on both sides passes the fixing unit (e.g., the fixing unit **17**) to be discharged to the sheet discharging tray (e.g., the output tray **21**). Consequently, air heated in the fixing unit is discharged to the in-body output sheet stacking section with the sheet. As a result, the temperature of air in the in-body output sheet stacking section increases, and therefore it is likely to increase the temperatures of components and parts defining the in-body output sheet stacking section of the image forming apparatus.

[0050] FIG. **2** is a schematic enlarged view illustrating the flow of air whose temperature increases in an area near the fixing unit **17** and the sheet discharging port **180** of a comparative image forming apparatus **100**A that discharges sheets to the sheet discharging port **180**.

[0051] Reference signals "H**1**", "H**2**", and "H**3**" indicated by broken arrows in FIG. **2** indicate respective air flows of air heated in the fixing unit **17**.

[0052] Air near the fixing unit **17** is heated together with the sheet P when an image is fixed by application of heat and pressure, and the temperature of the air increases, as indicated by the air flow H**1** in FIG. **2**. Then, the heated air that has reached a discharging port interior space **50** disposed in the vicinity of the highest part of the casing **19** flows toward the sheet discharging port **180** through which the air flows towards the outside of the casing **19**, as indicated by the air flow H**2** in FIG. **2**. Then, the heated air is discharged together with the sheet P from the sheet discharging port **180** to the output sheet stacker **20**, as indicated by the air flow H**3** in FIG. **2**.

[0053] In an apparatus such as the comparative image forming apparatus **100**A in which the sheet P having an image thereon is discharged in the in-body output sheet stacker **20**, when the heated air is discharged outside together with the sheet P, the heated air stays in the space of the output sheet stacker **20**, as indicated by an area Ha in FIG. **2**. As a result, the temperature of the air in the output sheet stacker **20** increases. Consequently, the heat of the high-temperature air gradually spreads around, causing an increase in the temperature of the comparative image forming apparatus **100**A.

[0054] However, as the temperature inside the image forming apparatus **100** increases, the temperature of the document reading device **2** also increases. Consequently, the optical components in the document reading device **2** may be deformed or distorted. If a document is read by the distorted components, it is likely that the image quality deteriorates. Further, as the temperature in the apparatus body **1** increases, the toner can melt and harden inside the apparatus body **1**, resulting in generation of fixed toner and coagulated toner, and therefore it is likely to degrade the image quality. Further, if the air in the output sheet stacker **20** is heated, it is likely that a user feels uncomfortable by contacting the heated air when removing the sheet P having the image or images from the output sheet stacker **20**.

[0055] For example, a known electrographic image forming apparatus includes an air drawing device. The air drawing device is disposed on a rear plate (i.e., a far side wall in FIG. **2**) of the comparative image forming apparatus **100**A. The rear plate is located outside in the width direction of the sheet conveying path between the fixing unit **17** and the sheet discharging port **180**. The air drawing device intakes outside air through an opening on a front plate (i.e., a near side wall in FIG. **2**) of the comparative image forming apparatus **100**A. The outside air passes through the space near the sheet conveying path between the fixing unit **17** and the sheet discharging port **180**, and goes out from the rear plate on which the air drawing device is disposed.

[0056] In this configuration, since the heated air on the front side of the comparative image forming apparatus **100**A flows toward the rear side, the temperature of the rear side of the comparative image forming apparatus **100**A increases. Then, as the heated air moves to the rear side of the comparative image forming apparatus **100**A, the air around the rear side is heated. Consequently, the temperature of an upstream side of the sheet conveying path and the temperature of a downstream side of the sheet conveying path become different from each other. In order to reduce the temperature of air over the entire width direction of the air drawing device sufficiently, the air drawing device is set to have high specifications, thereby decreasing the efficiency to prevent an increase in temperature of the air drawing device. Further, this configuration extremely reduces the temperature of air on the front side of the air drawing device where the temperature is lowest. Since the heat generated in the fixing unit **17** is conducted to the cooled air, it is likely to cool an area in the vicinity of the fixing unit **17** extremely. If the area near the fixing unit **17** is extremely cooled, the heater of the fixing unit **17** is turned on more quickly, and therefore the power consumption of the apparatus body **1** of the comparative image forming apparatus **100**A increases. Therefore, it is demanded to discharge air in the discharging port interior space **50** more efficiently.

[0057] Another comparative image forming apparatus has a configuration in which air in the in-body output sheet stacking section is drawn to be exhausted from the rear side of the image forming apparatus. Thus, in the configuration in which air in the in-body output sheet stacking section is drawn, the heated air can be discharged outside the in-body output sheet stacking section. Therefore, this configuration can prevent the heated air from staying in the in-body output sheet stacking section. However, the heated air continuously flows from the sheet discharging port to the in-body output sheet stacking section with the sheet. In this case, the heated air is supplied constantly to the in-body output sheet stacking section, and therefore an increase in temperature of the air in the in-body output sheet stacking section cannot be prevented.

[0058] In addition, the comparative image forming apparatus further includes an air exhaust path through which heat from the fixing unit, for example, is exhausted to the outside of the comparative image forming apparatus. However, air is drawn and exhausted from one end in the width direction of the image forming apparatus, and therefore temperature gradient occurs in the width direction of the image forming apparatus. Specifically, the temperature in the image forming apparatus gradually increases from one end of the air exhaust path on which the air drawing device is not disposed

toward the other end on which the air drawing device is disposed in the width direction of the image forming apparatus.

[0059] Next, a description is given of the detailed configuration of the image forming apparatus **100** according to the present embodiment of this disclosure.

[0060] FIG. **3** is a schematic enlarged view illustrating an area near the fixing unit **17** and the sheet discharging port **180** of the image forming apparatus **100** according to the present embodiment of this disclosure. FIG. **4** is an enlarged perspective view illustrating an area near the sheet conveying path R**1** between the fixing unit **17** and the sheet discharging port **180**.

[0061] As illustrated in FIGS. **3** and **4**, the sheet conveying path R**1** between the fixing unit **17** and the sheet discharging port **180** is defined by an upstream upper guide plate **30**, a downstream upper guide plate **31**, and a lower guide plate **32**. The upstream upper guide plate **30** is disposed upstream from the sheet discharging port **180** in the sheet conveying path R**1** and above the sheet conveying path R**1**. The downstream upper guide plate **31** is disposed upstream from the sheet discharging port **180** and downstream from the upstream upper guide plate **30** in the sheet conveying path R**1** and above the sheet conveying path R**1**. The lower guide plate **32** is disposed upstream from the sheet discharging port **180** in the sheet conveying path R**1** and below the sheet conveying path R**1**. As illustrated in FIG. **4**, the upstream upper guide plate **30** includes an upstream side guide opening **30***a* and the downstream upper guide plate **31** includes a downstream side guide opening **31***a*. The upstream side guide opening **30***a* and the downstream side guide opening **31***a* are disposed within a sheet passing range in the width direction of the sheet P in the sheet conveying path R**1** (i.e., a direction from the front side to the rear side of the image forming apparatus **100** illustrated in FIG. **3**.

[0062] Each of the upstream side guide opening **30***a* and the downstream side guide opening **31***a* has a shape of a slot extending in the sheet conveying direction of the sheet P.

[0063] Further, when a direction intersecting the sheet conveying direction of the sheet P is defined as a width direction of the sheet P, the upstream side guide opening **30***a* and the downstream side guide opening **31***a* are disposed within a sheet passing range in the width direction of the sheet P. Therefore, both lateral ends in the width direction of the sheet P do not enter into the upstream side guide opening **30***a* and the downstream side guide opening **31***a* and can be prevented from being caught by the upstream side guide opening **30***a* and the downstream side guide opening **31***a*.

[0064] Further, the image forming apparatus **100** further includes at least one air drawing opening such as the downstream side guide opening **31***a* in the width direction of the sheet P. By including multiple air drawing openings, the temperature gradient in the width direction of the sheet P in the sheet conveying path R**1** can be prevented. Further, even when a single air drawing opening is provided, if the single air drawing opening is a long slot extending in the width direction of the sheet P, the same effect as above can be provided.

[0065] As illustrated in FIG. **3**, the image forming apparatus **100** includes a wall **190** that functions as a duct lower plate to block a space above the fixing unit **17**. The wall **190** also functions as a partition that separates the fixing unit **17** and the pair of sheet discharging rollers **18** from an air flow indicated by a broken arrow F in FIG. **3**. The wall **190** forms a lower face of an air exhaust duct **52**. The wall **190** that functions as a duct lower plate includes an air passage opening **45** disposed facing the downstream upper guide plate **31**. An air suction fan **42** that functions as an air suction fan and an air suction device is disposed inside the air exhaust duct **52**. The air passage opening **45** is disposed above an area where the sheet P passes in the width direction of the sheet P in the sheet conveying path R**1** (i.e., the front to rear direction in FIG. **3**). Further, the air passage opening **45** is disposed facing the downstream side guide opening **31***a*.

[0066] By driving the air suction fan **42**, an air flow H**5** in the air exhaust duct **52** is drawn to the air suction fan **42** to move to the right in FIG. **3** and discharged from the air exhaust port **53** to the outside of the image forming apparatus **100** (indicated as an air flow H**6**).

[0067] Further, by driving the air suction fan **42**, a negative pressure is applied on the air passage opening **45**. Consequently, the air flow H**2** of the air flowing inside the discharging port interior space **50** passes through the air passage opening **45** to move toward the air exhaust duct **52** (indicated as an air flow H**4**). With this movement of air, a negative pressure is also applied on the downstream side guide opening **31***a*. Consequently, the air inside the sheet conveying path R**1** passes through the downstream side guide opening **31***a* to move toward the discharging port interior space **50**. Further, with this movement of air, a negative pressure is also applied on the sheet discharging port **180**. Consequently, the air inside the output sheet stacker **20** passes through the sheet discharging port **180** to move toward the sheet conveying path R**1** of the sheet P.

[0068] By driving the air suction fan **42**, the above-described movements of air occur. Therefore, the air flow indicated by a broken arrow F in FIG. **3** is generated, flowing toward the outside of the image forming apparatus **100** from the output sheet stacker **20** via the sheet conveying path, the discharging port interior space **50**, and the air exhaust duct **52**.

[0069] As illustrated in FIGS. **3** and **4**, the image forming apparatus **100** draws air via the downstream side guide opening **31***a* and the air passage opening **45**, both of which are disposed inside an area where the sheet P passes in the sheet conveying path in the width direction of the sheet P. With this configuration, an area around the downstream side guide opening **31***a* in the sheet conveying path in the width direction of the sheet P reaches a highest temperature. Therefore, the image forming apparatus **100** has the temperature gradient in which the temperature changes from the area in the vicinity of the downstream side guide opening **31***a* and gradually decreases as the air moves far from the downstream side guide opening **31***a*. As described above, the downstream side guide opening **31***a* is disposed inside the area where the sheet P passes in the sheet conveying path in the width direction of the sheet P. Accordingly, the temperature of a far end side of the sheet conveying path in the width direction of the sheet P, which is far from the downstream side guide opening **31***a* is lower than a near end side of the sheet conveying path in the width direction of the sheet P. Specifically, the temperature of the far end side of the sheet conveying path in the width direction of the sheet P is lowest in the image forming apparatus **100**. At this time, a distance between a portion at the highest temperature and a portion at the lowest temperature in the sheet conveying path in the sheet width direction of the image forming

apparatus **100** is shorter than a distance thereof in a configuration in which air is drawn from one end side of the sheet conveying path in the width direction of the sheet P. Therefore, a difference of temperatures in the sheet width direction generated due to temperature gradient can be reduced.

[0070] Further, by arranging multiple downstream side guide openings **31***a* and multiple air passage openings **45** in the sheet width direction, the air can be drawn over the entire sheet width direction when compared with the configuration in which air is drawn from one end side of the sheet conveying path in the width direction of the sheet P. By so doing, the heated air inside the sheet conveying path R**1** and the discharging port interior space **50** in the sheet width direction can be discharged thoroughly to the outside of the image forming apparatus **100**, and therefore the temperature gradient in the sheet conveying path R**1** in the sheet width direction can be reduced.

[0071] Further, the air flow H**1** of the air heated by heat of the fixing unit **17** is drawn at a position upstream from the sheet discharging port **180** in the sheet conveying direction and is exhausted to the outside of the image forming apparatus **100**. Therefore, the air flow H**1** of the air at high temperature is prevented from being discharged to the output sheet stacker **20**. Consequently, an increase in the temperature of the output sheet stacker **20** can be prevented.

[0072] In the image forming apparatus **100** according to the present embodiment of this disclosure, the air suction fan **42** is disposed above an area where the sheet P passes through in the width direction in the sheet conveying path (i.e., the front to rear direction in FIG. **3**). The downstream side guide opening **31***a* is disposed above the sheet conveying path through which the sheet P is conveyed in the horizontal direction. According to this configuration, when the air suction fan **42** is driven, an air flow that moves in a direction perpendicular to the sheet conveying direction R**1** and the sheet width direction is generated.

[0073] Accordingly, the image forming apparatus **100** includes the air suction fan **42** in the area where the sheet P passes in the sheet width direction of the sheet conveying path, so as to draw air in a direction perpendicular to in the sheet conveying direction. According to this configuration, air can be drawn over the entire sheet width direction, and therefore an air flow indicated by a two-dot chain line arrow F in FIG. **3** is generated to draw air over the entire sheet width direction of the sheet P efficiently.

[0074] By drawing air from the sheet conveying path R**1** efficiently, the sheet discharging port **180** can generate an air flow moving from the output sheet stacker **20** to the sheet conveying path R**1**. More specifically, by drawing vapor such as air flowing as the air flow H**2** and the air flow H**4** from an air drawing opening such as the air passage opening **45**, the air suction fan **42** can generate an air flow that moves from an output sheet stacking section such as the output sheet stacker **20** into an interior of an housing such as the casing **19** via a sheet exhaust port such as the sheet discharging port **180**. According to the air flow, an air flow that moves in a direction opposite to the sheet conveying direction of the sheet P is generated in an area in the vicinity of the sheet discharging port **180**. Therefore, the heated air is prevented from being discharged from the sheet discharging port **180** to the output sheet stacker **20** together with the sheet P. Consequently, an increase in the temperature of the output sheet stacker **20** can be prevented.

[0075] Further, the air suction fan **42** draws vapor such as air in the sheet conveying path R**1** between the fixing unit **17** and a discharging port such as the sheet discharging port **180**. Accordingly, the vapor such as the air is exhausted toward the outside of the image forming apparatus **100** before the air flow H**1** of the air heated in the fixing unit **17** is discharged from the sheet discharging port **180**. Therefore, the air flow H**1** of the air at high temperature is prevented from being discharged to an output sheet stacker such as the output sheet stacker **20**. Consequently, an increase in the temperature of the output sheet stacker **20** can be prevented.

[0076] FIG. **5** is a schematic top view illustrating the air exhaust duct **52**.

[0077] As illustrated in FIG. **5**, the image forming apparatus **100** further includes multiple air passage openings **45**. The image forming apparatus **100** draws air from each of the multiple air passage openings **45** and exhausts the air flow H**4** from the air exhaust port **53** that is disposed on the right side face of the apparatus body **1** of the image forming apparatus **100** (indicated as the air flow H**5** and the air flow H**6**). Each of the air passage openings **45** has a shape of a slot extending in the sheet width direction that intersects the sheet conveying direction of the sheet P and is disposed facing (or right above) the downstream side guide opening **31***a*. Further, in order to increase the exhaust efficiency, the air exhaust duct **52** that defines an air flow path has a shape that tapers from the air passage opening **45** to the air suction fan **42**. In a case in which the air suction fan **42** has high specifications or in which the multiple air suction fans **42** are arranged in parallel, the air exhaust duct **52** may not have the tapered shape. By disposing the multiple air drawing devices, a flow path in which vapor such as air moves from an air drawing opening such as the downstream side guide opening **31***a* to the multiple air drawing devices is not tapered, thereby enhancing the exhaust efficiency.

[0078] By arranging the multiple downstream side guide openings **31***a* and the multiple air passage openings **45**, as illustrated in FIGS. **4** and **5**, the air flow H**4** of the air heated over the entire width direction of the sheet P can be drawn. By so doing, generation of the temperature gradient in the width direction of the sheet P in the sheet conveying path and the discharging port interior space **50** can be prevented.

[0079] The fixing unit **17** further includes a function to store heat in order to fix the image formed on the sheet P to the sheet P. However, the image forming apparatus **100** draws air from the space between the fixing unit **17** and the sheet discharging port **180** and exhausts the air in the space to the outside the image forming apparatus **100**. Therefore, it is likely that the air that needs to remain at high temperature is cooled. If the temperature of the fixing unit **17** is cooled, heat that is needed for fixing is taken, and therefore, the power consumption of the entire image forming apparatus **100** increases.

[0080] By contrast, the image forming apparatus **100** according to the present embodiment further includes a shield wall **43**, as illustrated in FIGS. **3** and **4**. The shield wall **43** shields an upper space **51** of the fixing unit **17** and a discharging port interior space **50** of the sheet discharging port **180**, so that heat of the fixing unit **17** is not removed.

[0081] As illustrated in FIGS. **3** and **4**, the shield wall **43** is positioned near the outside of the upper face of the fixing unit **17**, which is a downstream side end face of the fixing unit **17** in the sheet conveying direction. If the shield wall **43** is disposed inside the fixing unit **17**, movement of the air

flow H1 illustrated in FIG. **3** cannot be shielded. Further, if the shield wall **43** is disposed closer to the output sheet stacker **20**, an air flow that is indicated by two-dot chain line with arrow F in FIG. **3** cannot obtain a sufficient distance in the sheet conveying path R1. Therefore, a sufficient cooling cannot be performed. Therefore, the shield wall **43** is disposed near the outside of the upper face of the fixing unit **17**.

[0082] The sheet P that is discharged from the fixing unit **17** is guided to the sheet discharging port **180** including the pair of sheet discharging rollers **18** by the upstream upper guide plate **30**, the downstream upper guide plate **31**, and the lower guide plate **32**. The upstream upper guide plate **30** includes an upstream side guide opening **30***a* and the downstream upper guide plate **31** includes a downstream side guide opening **31***a*. Then, as an air flow that is generated by driving the air suction fan **42** passes through the downstream side guide opening **31***a*, the sheet conveying path R1 is cooled.

[0083] Part of the air flow H1 of the air at high temperature that is heated by the fixing unit **17** passes below the shield wall **43** together with the sheet P to flow toward the downstream side of the sheet conveying path R1. The heated air heated by the heat of the sheet P and the heated air that passes below the shield wall **43** are sucked by the air suction fan **42** to pass through the downstream side guide opening **31***a* before being exhausted to the outside of the image forming apparatus **100**. Accordingly, the heated vapor such as the heated air flowing in the sheet conveying path R1 toward the sheet discharging port together with a recording medium such as the sheet P can be drawn from the air passage opening and can be prevented from being discharged together with the recording medium through the sheet discharging port to the output sheet stacker. Consequently, an increase in the temperature of the output sheet stacker **20** can be prevented.

[0084] The shield wall **43** is disposed between the upstream upper guide plate **30** and the downstream upper guide plate **31** and is located upstream from the downstream side guide opening **31***a* in the sheet conveying path R1. The downstream side guide opening **31***a* is an opening through which the air is sucked by the air suction fan **42** in the sheet conveying path R1.

[0085] By so doing, the heated air heated by the fixing unit **17** is blocked by the shield wall **43**, except the air that has passed below the shield wall **43**, and stays in the upper space **51** of the fixing unit **17**. Since the air at high temperature remains in the upper space **51** adjacent to the fixing unit **17**, the air that needs to remain heated in the fixing unit **17** is prevented from being cooled, and therefore an increase in the power consumption of the entire image forming apparatus **100** can be prevented.

[0086] Further, by including the shield wall **43** in the image forming apparatus **100**, the air that reaches the discharging port interior space **50** of the sheet discharging port **180** from the upstream side (the right side in FIG. **3**) from the shield wall **43** is limited to the air that passes below the shield wall **43**. At this time, an amount of flow of air that passes through the air passage opening **45** by suction of the air suction fan **42** is set to be smaller than an amount of flow that passes below the shield wall **43**. Specifically, this setting of the amount of flow of air can be achieved by making an opening area of the sheet discharging port **180** greater than a cross sectional area of a gap below the shield wall **43** through which the air passes. Accordingly, the air can pass through the sheet discharging port **180** more easily than the gap below the shield wall **43**. Therefore, generation of air flow that flows from the output sheet stacker **20** into the casing **19** via the sheet discharging port **180** can be promoted.

[0087] Accordingly, the image forming apparatus **100** can generate air that flows from the output sheet stacker **20** via the sheet discharging port **180** into the casing **19**, then passes through the downstream side guide opening **31***a*, the air passage opening **45**, and the air suction fan **42**, and is exhausted through the air exhaust port **53** to the outside of the image forming apparatus **100**.

[0088] The air in the output sheet stacker **20** is drawn from the sheet discharging port **180**, so that air that flows in an opposite direction to the sheet conveying direction of the sheet P is generated in the area in the vicinity of the sheet discharging port **180** to be discharged. By so doing, the air at high temperature is prevented from being exhausted into the output sheet stacker **20** and the air in the image forming apparatus **100** can be cooled.

[0089] Further, by disposing the shield wall **43**, the air that needs to remain heated in the image forming device **110** such as the fixing unit **17** is prevented from being cooled, and therefore an increase in the power consumption of the entire image forming apparatus **100** can be prevented. Further, by disposing the shield wall **43**, an air flow path of air moving from the image forming device **110** toward an air drawing opening such as the downstream side guide opening **31***a* and the air passage opening **45** is tapered, thereby reducing the amount of air flow. Accordingly, generation of air flow that flows from an output sheet stacker such as the output sheet stacker **20** through a sheet discharging port to the interior of a housing such as the casing **19** toward the air passage opening can be promoted. Accordingly, the vapor such as the air toward an opposite direction to the sheet conveying path R1 of a recording medium such as the sheet P is generated. Therefore, the heated air is prevented from being exhausted together with the sheet P from the sheet discharging port to the output sheet stacker. Consequently, an increase in the temperature of the output sheet stacker **20** can be prevented.

[0090] FIG. **6** is a diagram illustrating a configuration of a cooling unit **48** in which a cooling mechanism **46** including an air passage opening **45** and an air suction fan **42** is provided with an outer cover **47** to cover the wall **190** and the air suction fan **42**. The cooling unit **48** functions as an air outlet device.

[0091] Air ducts and fans are included in a cooling unit to function typically as a cooling mechanism. Since attachment and detachment of the other units have higher priority to the cooling unit, the air ducts and fans are generally assembled as structural parts. In recent years, environmental loading reduction and good serviceability such as disassemblability and recyclability are demanded. Therefore, easy attachment and detachment is also desired to structural parts.

[0092] In the configuration illustrated in FIG. **6**, the cooling mechanism **46** includes a recess **54** in the wall **190** that functions as a duct lower plate. The recess **54** of the wall **190** engages with a projection **55** mounted on the outer cover **47**. The projection **55** functions as an engaging portion. As described above, the cooling mechanism **46** is attached to the outer cover **47** to construct the cooling unit **48**. Therefore, the cooling mechanism **46** can be attached and detached with respect to the apparatus body **1** of the image forming apparatus **100** easily. The cooling unit **48** can be

removed from the apparatus body **1** in a direction from the left to the right in FIG. **1**, which is an opposite direction to the sheet conveying direction in the sheet conveying path R**1**. According to this configuration, the serviceability (e.g., disassemblability and recyclability) and assemblability of the image forming apparatus **100** are enhanced. It is to be noted that, the cooling unit **48** is disposed between the fixing unit **17** and the document reading device **2**, as illustrated in FIG. **3**.

[0093] FIG. **7** is a schematic enlarged view illustrating an area near the fixing unit **17** and the sheet discharging port **180**. The configuration of FIG. **7** is a variation of the configuration of FIG. **3**. FIG. **8** is an enlarged perspective view illustrating an area near the sheet conveying path of the sheet P between the fixing unit **17** and the sheet discharging port **180**. The configuration of FIG. **8** is a variation of the configuration of FIG. **4**.

[0094] As illustrated in FIG. **7**, the reverse path switching claw **26** is disposed between the upstream upper guide plate **30** and the downstream upper guide plate **31**.

[0095] As described above, when performing a single-side printing, the reverse path switching claw **26** is switched to a position illustrated in FIG. **7** to guide the sheet P that has passed through the fixing unit **17** to the sheet discharging port **180**. By contrast, when performing a duplex printing, the reverse path switching claw **26** is switched to the position as illustrated in FIG. **7** and a first half on the leading edge side of the sheet P is exposed to the output sheet stacker **20** while the sheet P is being held between the pair of sheet discharging rollers **18**. Thereafter, the leading edge of the reverse path switching claw **26** is rotated downwardly to guide the sheet P that has switched back from the pair of sheet discharging rollers **18** to the sheet reverse path R**3** by the upper face of the downstream upper guide plate **31** and the upper face of the reverse path switching claw **26**.

[0096] An upstream end in the sheet conveying direction of the reverse path switching claw **26** (the right side of FIG. **7**) is disposed movable close to and far from the upstream side guide opening **30***a*, as illustrated in FIGS. **7** and **8**. When the reverse path switching claw **26** enters the upstream side guide opening **30***a*, a gap is formed between an outer circumference of the reverse path switching claw **26** and an inner circumference of the upstream side guide opening **30***a*. The air flow of the heated air of the sheet P after the fixing operation moves upward from the gap. Consequently, the heated air that has passed through the upstream side guide opening **30***a*, the air flow H**2** of the heated air that has passed through the downstream side guide opening **31***a*, and the air flow H**1** of the heated air that moves upward from the fixing unit **17** pass through the air passage openings **45**, then through the air suction fan **42**. As a result, air flow to be discharged from the air exhaust port **53** to the outside of the image forming apparatus **100** is generated. It is to be noted that a direction in which the air flow is discharged outside the image forming apparatus **100** is opposite to a direction in which the sheet P is discharged from the sheet discharging port **180**.

[0097] FIG. **9** is a diagram illustrating a configuration of a cooling unit in which a cooling mechanism including an air passing opening and an air suction fan is provided with an outer cover. The configuration of FIG. **9** is a variation of the configuration of FIG. **5**.

[0098] The outer cover **47** has four side faces and a bottom face that is open. One side face of the four side faces is an upper left side face in FIG. **9** and functions as the casing **19** (see FIG. **3**) extending upward from the sheet discharging port **180**. Further, a retreating portion **58** is disposed at the lower edge of the side face to prevent intervening of the pair of sheet discharging rollers **18**. Multiple retreating portions **58** are aligned in the width direction that intersects with the sheet conveying direction.

[0099] The air suction fan **42** is attached to an inner surface of the cover **47**. By attaching the outer cover **47** with the air suction fan **42** to the cooling mechanism **46**, the air suction fan **42** is contained in a position indicated by a broken line in FIG. **9**, which is inside the air exhaust duct **52**.

[0100] The air exhaust duct **52** is disposed projecting from the wall **190** functioning as a duct lower plate. An air exhaust port **53** is provided at a leading end face of the air exhaust duct **52**. The air exhaust port **53** is disposed at a position facing an opening **56** of the outer cover **47**. When the outer cover **47** is attached to the cooling mechanism **46**, the air exhaust port **53** is exposed from the opening **56**. Further, the air exhaust duct **52** includes a slit **57** that engages with a lateral side face of the air suction fan **42**. Accordingly, the air suction fan **42** is positioned relative to the air suction fan **42** reliably.

[0101] FIG. **10** is a schematic top view illustrating an exhaust duct.

[0102] A basic configuration of the cooling unit is identical to the configuration of the cooling unit illustrated in FIG. **9**.

[0103] Different from the configuration illustrated in FIG. **9**, the exhaust duct of FIG. **10** includes a guide **60** to engage with a guide rail **59** of the apparatus body. The guide **60** is provided on the side face of the outer cover **47**. Accordingly, the cooling unit can be removed from a removing direction D that is identical to the sheet conveying path R**1**. Further, the left side face of the outer cover **47** functions as the casing **19** that extends upward from the sheet discharging port **180**. Therefore, by releasing the cooling unit and the image forming apparatus from each other, the cooling unit can be pulled out easily.

[0104] FIG. **11** is a schematic top view illustrating the exhaust duct.

[0105] The downstream side guide opening **31***a* is not limited to a slot shape that extends in the sheet conveying direction, as illustrated in FIG. **4**. For example, the downstream side guide opening **31***a* may have a rectangular shape, as illustrated in FIG. **11**. Further, the downstream side guide opening **31***a* is disposed immediately below the air passage opening **45**, and multiple downstream side guide openings **31***a* are aligned within the width of the air passage opening **45**. Further, the downstream side guide opening **31***a* is disposed to pass through the air passage opening **45** in the sheet conveying direction.

[0106] The sheet P that functions as a recording medium is not limited to indicate a regular paper material such as a plain paper but also includes thick paper, post card, envelope, thin paper, coated paper, art paper, tracing paper, and OHP (overhead projector) transparent film sheet.

[0107] It is to be noted that an image forming apparatus that can include the above-described features of the image forming apparatus **100** according to the present embodiment is not limited to include an image forming device and a document reading device disposed vertically with an in-body output sheet stacking section interposed therebetween. Specifically, this disclosure can be applied to any image

forming apparatus that includes an output sheet stacker provided in an in-body space extending in a vertical direction so that a recording medium is discharged to the output sheet stacker and is removed by a user by inserting his/her hand through an opening on a side face of the apparatus body.

[0108] For example, this disclosure can be applied to an image forming apparatus such as a printer having the output sheet stacker in a space that is defined by an image forming device disposed at the upper part of the image forming apparatus and a sheet feeding device disposed at the lower part of the image forming apparatus and that is opening on at least one side wall of the apparatus body.

[0109] The above-described embodiments are illustrative and do not limit this disclosure. Thus, numerous additional modifications and variations are possible in light of the above teachings. For example, elements at least one of features of different illustrative and exemplary embodiments herein may be combined with each other at least one of substituted for each other within the scope of this disclosure and appended claims. Further, features of components of the embodiments, such as the number, the position, and the shape are not limited the embodiments and thus may be preferably set. It is therefore to be understood that within the scope of the appended claims, the disclosure of this disclosure may be practiced otherwise than as specifically described herein.

What is claimed is:

1. An image forming apparatus comprising:
an apparatus body;
an image forming device disposed in the apparatus body to form an image on a recording medium;
a casing to accommodate the image forming device;
a sheet discharging port through which the recording medium having the image formed by the image forming device is discharged from the casing;
a sheet stacker to stack the recording medium output through the sheet discharging port,
the sheet stacker surrounded by outer walls and having an opening on one side of the apparatus body,
the outer walls including an outer wall having the sheet discharging port;
an air guide opening disposed within a sheet passing range in a width direction of the recording medium in a sheet conveying path through which the recording medium having the image passes from the image forming device to the sheet discharging port; and
an air suction fan disposed in the apparatus body to discharge air passing through the air guide opening to an outside of the casing.

2. The image forming apparatus according to claim **1**, further comprising a fixing device to fix the image to the recording medium by application of heat,
wherein the air suction fan sucks the air in the sheet conveying path defined by the fixing device and the sheet discharging port.

3. The image forming apparatus according to claim **1**,
wherein the air suction fan sucks the air passing through the air guide opening to generate an air flow flowing from the sheet stacker via the sheet discharging port to an inside of the apparatus body.

4. The image forming apparatus according to claim **1**, further comprising a guide to guide the recording medium having the image to the sheet discharging port,
wherein the air suction fan includes:
the air guide opening in the guide; and
an air suction device to draw the air near the air guide opening and exhaust the air outside the casing.

5. The image forming apparatus according to claim **4**,
wherein the air guide opening includes one or more air guide openings in the width direction of the recording medium.

6. The image forming apparatus according to claim **4**,
wherein the air suction device includes one or more air suction devices in the width direction of the recording medium.

7. The image forming apparatus according to claim **6**, further comprising:
a wall disposed above and facing the sheet conveying path;
an air passage opening disposed in the wall and facing the air guide opening; and
an air exhaust duct projecting from the wall to form an air flow from the air passage opening to the air suction device.

8. The image forming apparatus according to claim **1**, further comprising:
a wall disposed above and facing the sheet conveying path; and
an air passage opening disposed in the wall and facing the air guide opening.

9. The image forming apparatus according to claim **8**,
wherein the air passage opening includes multiple air passage openings arrayed in a width direction of the recording medium intersecting the sheet conveying direction of the recording medium, each of the multiple air passage openings having a slot extending in the width direction of the recording medium intersecting the sheet conveying direction of the recording medium.

10. The image forming apparatus according to claim **8**,
wherein an air flows from the sheet discharging port to the air passage opening in an opposite direction to the sheet conveying direction of the recording medium at the sheet discharging port.

11. The image forming apparatus according to claim **1**, further comprising an air outlet device to integrally support components of the air suction fan,
wherein the air outlet device is detachably attached to the apparatus body.

12. An image forming apparatus comprising:
a fixing device to fix an image formed on a recording medium to the recording medium;
a sheet discharging rotary body to discharge the recording medium that has passed through the fixing device;
a guide disposed between the fixing device and the sheet discharging rotary body to guide the recording medium to the sheet discharging rotary body,
the guide including multiple air guide openings within a range facing the recording medium; and
an air suction fan disposed above the multiple air guide openings,
the air suction fan discharging air drawn via the multiple air guide openings to an outside of an apparatus body.

13. The image forming apparatus according to claim **12**, further comprising a wall disposed above the sheet discharging rotary body, the fixing device, and the guide,
the wall having an air passage opening to draw air drawn via the multiple air guide openings,

wherein the air drawn through the air passage opening is guided to the air suction fan.

14. The image forming apparatus according to claim **13**, further comprising:

a cover to cover the wall and the air suction fan; and

an engaging portion to engage with the wall.

15. The image forming apparatus according to claim **14**, wherein the cover, the wall, and the air suction fan are removable from the apparatus body as a single unit in a direction identical to the sheet conveying direction by the sheet discharging rotary body.

16. The image forming apparatus according to claim **13**, wherein the air passage opening includes multiple air passage openings arrayed in a direction intersecting the sheet conveying direction of the recording medium, each of the multiple air passage openings having a slot extending in the direction intersecting the sheet conveying direction of the recording medium.

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