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IMAGE FORMING APPARATUS

Abstract

An image forming apparatus includes an endless intermediate transfer belt, a plurality of rollers, a density sensor, and a positioning portion. The positioning portion is disposed opposite the density sensor, at the inner circumferential side of the intermediate transfer belt, and contacts the inner circumferential surface of the intermediate transfer belt to keep a predetermined distance across the gap between the intermediate transfer belt and the density sensor. The positioning portion includes a support member disposed at the inner circumferential side of the intermediate transfer belt to face the intermediate transfer belt, and an electrically conductive non-woven fabric laid on the surface of the support member facing the intermediate transfer belt to contact the inner circumferential surface of the intermediate transfer belt.

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Background/Summary

INCORPORATION BY REFERENCE

[0001] This application is based on and claims the benefit of priority from Japanese Patent Application No. 2024-018723 filed on Feb. 9, 2024, the contents of which are hereby incorporated by reference.

BACKGROUND

[0002] The present disclosure relates to an image forming apparatus.

[0003] In image forming apparatuses employing an electrophotographic system, such as copiers and printers, it is common to supply toner to an electrostatic latent image formed on the outer circumferential surface of a photosensitive drum to develop it into a toner image that will subsequently be transferred to a sheet (recording medium). The density of the toner image formed by the image forming apparatus changes with time for various causes. Thus, calibration is commonly performed, in which a toner image for density correction (a reference image) is formed on the outer circumferential surface of the photosensitive drum or of an intermediate transfer belt and the toner density of the toner image is sensed with a sensor to perform density correction. Keeping the distance between the sensor and the toner image constant is important in proper density correction.

SUMMARY

[0004] According to one aspect of the present disclosure, an image forming apparatus includes an endless intermediate transfer belt, a plurality of rollers, a density sensor, and a positioning portion. Around the plurality of rollers, the intermediate transfer belt is rotatably stretched. The density sensor outputs a sensed value of the toner density of a toner image transferred to the outer circumferential surface of the intermediate transfer belt. The positioning portion is disposed opposite the density sensor, at the inner circumferential side of the intermediate transfer belt, and contacts the inner circumferential surface of the intermediate transfer belt to keep a predetermined distance across the gap between the intermediate transfer belt and the density sensor. The positioning portion includes a support member that is disposed at the inner circumferential side of the intermediate transfer belt so as to face the intermediate transfer belt, and an electrically conductive non-woven fabric that is laid on the surface of the support member facing the intermediate transfer belt so as to contact the inner circumferential surface of the intermediate transfer belt.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. **1** is a schematic sectional front view of an image forming apparatus according to one embodiment of the present disclosure.

[0006] FIG. **2** is a block diagram showing the configuration of the image forming apparatus in FIG. **1**.

[0007] FIG. **3** is a schematic sectional front view around a secondary transfer portion in the image forming apparatus in FIG. **1**.

[0008] FIG. **4** is a graph showing the surface resistivity of an intermediate transfer belt in an image forming apparatus of a comparative example.

[0009] FIG. **5** is a graph showing the change of the surface resistivity of an intermediate transfer belt in the image forming apparatus of a practical example.

[0010] FIG. **6** is a diagram illustrating the configuration of a bias applying circuit around the secondary transfer portion in FIG. **3**.

DETAILED DESCRIPTION

[0011] Now, an embodiment of the present disclosure will be described with reference to the drawings. Note that the description below is not meant to limit the scope of the present disclosure.

[0012] FIG. **1** is a schematic sectional front view of an image forming apparatus **1** according to the embodiment. FIG. **2** is a block diagram showing the configuration of the image forming apparatus **1** in FIG. **1**. FIG. **3** is a schematic sectional front view around a secondary transfer portion **33** in the image forming apparatus **1** in FIG. **1**. One example of the image forming apparatus **1** according to the embodiment is a tandem color printer that transfers a toner image to a sheet S using an intermediate transfer belt **31**. The image forming apparatus **1** can be what is called a multifunction peripheral having functions of, for example, printing, scanning (image reading), facsimile transmission, and the like.

[0013] As shown in FIGS. **1**, **2**, and **3**, the image forming apparatus **1** includes, inside its body **2**, a sheet feeding portion **3**, a sheet conveying portion **4**, an exposure portion **5**, an image forming portion **20**, a transferring portion **30**, a fixing portion **6**, a sheet ejection portion **7**, a control portion **8**, and a memory **9**.

[0014] The sheet feeding portion **3** is disposed in a bottom part of the body **2**. The sheet feeding portion **3** stores a plurality of unprinted sheets S and separates and feeds out one sheet S after another for printing. The sheet conveying portion **4** extends in the top-bottom direction along a side wall of the body **2**. The sheet conveying portion **4** conveys the sheet S fed from the sheet feeding portion **3** to the secondary transfer portion **33** and the fixing portion **6**, and ejects the sheet S after fixing through the sheet ejection port **4***a* to the sheet ejection portion **7**. The exposure portion **5** is disposed above the sheet feeding portion **3**. The exposure portion **5** exposes the image forming portion **20** to laser light controlled based on image data.

[0015] The image forming portion **20** is disposed above the exposure portion **5**, below the intermediate transfer belt **31**. The image forming portion **20** includes an image forming portion **20**Y for yellow, an image forming portion **20**C for cyan, an image forming portion **20**M for magenta, an image forming portion **20**B for black. These four image forming portions **20** have basically the same configuration. Thus, in the following description, except when distinction is needed, suffixes distinguishing the colors, "Y," "C," "M," and "B" are sometimes omitted.

[0016] The image forming portion **20** includes a photosensitive drum **21** that is supported so as to be rotatable in a predetermined direction (clockwise in FIGS. **1** and **3**). The image forming portion **20** further includes a charging portion **22**, a development portion **23**, and a drum cleaning portion **24** that are disposed around the photosensitive drum **21** along its rotational direction. Note that a primary transfer portion **32** is disposed between the development portion **23** and the drum cleaning portion **24**.

[0017] The photosensitive drum **21** has a photosensitive layer formed on its outer circumferential surface. The charging portion **22** electrostatically charges the outer circumferential surface of the photosensitive drum **21** to a predetermined surface potential. The exposure portion **5** exposes the outer circumferential surface of the photosensitive drum **21** charged by the charging portion **22** to light to form, by attenuating the charge on the outer circumferential surface of the photosensitive drum **21**, an electrostatic latent image based on a document image. The development portion **23** supplies toner to and thereby develops the electrostatic latent image on the outer circumferential surface of the photosensitive drum **21** to form a toner image. The four image forming portions **20** form toner images of mutually different colors. The drum cleaning portion **24** performs cleaning by removing the residual toner left on the outer circumferential surface of the photosensitive drum **21** after primary transfer of the toner images to the outer circumferential surface of the intermediate transfer belt **31**. In this way, the image forming portion **20** forms the image (toner image) that will be subsequently transferred to the sheet S.

[0018] The transferring portion **30** includes the intermediate transfer belt **31**, the primary transfer portions **32**Y, **32**C, **32**M, and **32**B, the secondary transfer portion **33**, and a belt cleaning portion **34**. The intermediate transfer belt **31** is disposed above the four image forming portions **20**. The intermediate transfer belt **31** is supported so as to be rotatable in a predetermined direction (counterclockwise in FIGS. **1** and **3**). The intermediate transfer belt **31** is an endless intermediate transfer member to which the toner images formed on the outer circumferential surfaces of the photosensitive drums **21** in the four image forming portions **20** are primarily transferred sequentially so as to be overlayed on each other. The four image forming portions **20** are disposed in what is called a tandem arrangement, in which they are arrayed in a row from upstream to downstream in the rotational direction of the intermediate transfer belt **31**.

[0019] The primary transfer portions **32**Y, **32**C, **32**M, and **32**B are disposed, across the intermediate transfer belt **31**, above the image forming portions **20**Y, **20**C, **20**M, and **20**B of the corresponding colors. The secondary transfer portion **33** is disposed upstream of the fixing portion **6** with respect to the sheet conveyance direction of the sheet conveying portion **4**, downstream of the four image forming portions **20**Y, **20**C, **20**M, and **20**B with respect to the rotational direction of the intermediate transfer belt **31**. The belt cleaning portion **34** is disposed downstream of the secondary transfer portion **33** with respect to the rotational direction of the intermediate transfer belt **31**.

[0020] The primary transfer portion **32** transfers the toner image formed on the outer circumferential surface of the photosensitive drum **21** to the intermediate transfer belt **31**. In other words, the toner image is primarily transferred to the outer circumferential surface of the intermediate transfer belt **31** at the primary transfer portions **32**Y, **32**C, **32**M, and **32**B of the corresponding colors. Then as the intermediate transfer belt **31** rotates, with predetermined timing, the toner images of the four image forming portions **20** are transferred to the intermediate transfer belt **31** sequentially so as to be overlayed on each other to form a color toner image having the toner images of four colors, namely yellow, cyan, magenta, and black, overlayed on each other on the outer circumferential surface of the intermediate transfer belt **31**.

[0021] The color toner image on the outer circumferential surface of the intermediate transfer belt **31** is transferred to the sheet S synchronously fed by the sheet conveying portion **4** at a secondary transfer nip portion formed in the secondary transfer portion **33**. The belt cleaning portion **34** performs cleaning by removing foreign matter such as residual toner left on the outer circumferential surface of the intermediate transfer belt **31** after secondary transfer. In this way, the transferring portion **30** transfers (records) the toner image formed on the outer circumferential surface of the photosensitive drum **21** to the sheet S.

[0022] The fixing portion **6** is disposed above the secondary transfer portion **33**. The fixing portion **6** heats and presses the sheet S having the toner image transferred to it to fix the toner image to the sheet S.

[0023] The sheet ejection portion **7** is disposed above the transferring portion **30**. The sheet S having the toner image fixed to it and having undergone printing is conveyed to the sheet ejection portion **7**. In the sheet ejection portion **7**, the printed sheet (printed matter) can be retrieved upward.

[0024] The control portion **8** includes a CPU, an image processing portion, and other electronic circuits and components (none of which is shown). The CPU controls the operation of different components in the image forming apparatus **1** based on programs and data for control stored in the memory **9** to perform processes related to the functions of the image forming apparatus **1**. The sheet feeding portion **3**, the sheet conveying portion **4**, the exposure portion **5**, the image forming portion **20**, the transferring portion **30**, and the fixing portion **6** individually receive instructions from the control portion **8** and operate together to perform printing on the sheet S.

[0025] The memory **9** is configured with a combination of a non-volatile memory device (not shown) such as a program ROM (read only memory) or a data ROM and a volatile memory device (not shown) such as a RAM (random access memory).

[0026] Now, the configuration around the transferring portion **30** will be described in detail. The transferring portion **30** includes an intermediate transferring device **40** as shown in FIGS. **1** and **3**. The intermediate transferring device **40** includes the intermediate transfer belt **31**, a drive roller (first support roller) **41**, a tension roller **42**, a support roller (second support roller) **43**, and four primary transfer rollers **32***r.*

[0027] The intermediate transfer belt **31** is an endless belt which is rotatably stretched around a plurality of rollers. In the embodiment, the plurality of rollers include the drive roller **41** and the tension roller **42**. Above the four image forming portions **20**Y, **20**C, **20**M, and **20**B, the primary transfer rollers **32***r* are respectively disposed across the intermediate transfer belt **31**. The four primary transfer rollers **32***r* are each disposed at a position opposite the photosensitive drums **21** across the intermediate transfer belt **31** so as to contact the inner circumferential surface of the intermediate transfer belt **31**.

[0028] For the intermediate transfer belt **31**, a dielectric resin member, that is, a resin member containing electrically conductive carbon, is used. The intermediate transfer belt **31** is a seamless belt without a seam. The surface resistivity of the intermediate transfer belt **31** is 9.5 [log Ω/sq.] or more but 10.5 [log Ω/sq.] or less.

[0029] The drive roller **41** is disposed downstream of the four primary transfer portions **32**Y, **32**C, **32**M, and **32**B with respect to the rotational direction of the intermediate transfer belt **31**. In other words, the drive roller **41** is disposed between the four primary transfer portions **32**Y, **32**C, **32**M, and **32**B and a density sensor **11**, which will be described later, with respect to the rotational direction of the intermediate transfer belt **31**. The drive roller **41** contacts the inner circumferential surface of the intermediate transfer belt **31** so as to have the intermediate transfer belt **31** rotatably stretched around it. The drive roller **41** receives power from a drive motor (not shown) to rotate the intermediate transfer belt **31** counterclockwise in FIGS. **1** and **3**.

[0030] The drive roller **41** is disposed adjacent to the secondary transfer portion **33**. In the secondary transfer portion **33**, a secondary transfer roller **33***r* is disposed. The secondary transfer roller **33***r* is disposed, across the intermediate transfer belt **31**, opposite the drive roller **41** so as to contact the outer circumferential surface of the intermediate transfer belt **31**. The secondary transfer roller **33***r* secondarily transfers the toner image primarily transferred to the outer circumferential surface of the intermediate transfer belt **31** to the sheet S passing between the secondary transfer roller **33***r* and the intermediate transfer belt **31**.

[0031] The tension roller **42** is disposed upstream of the four primary transfer portions **32**Y, **32**C, **32**M, and **32**B with respect to the rotational direction of the intermediate transfer belt **31**. The tension roller **42** rotates counterclockwise in FIG. **1** by following the rotation of the intermediate transfer belt **31**. The opposite ends of the tension roller **42** in the axial direction are urged by a pair of tension springs (not shown) in the direction away from the drive roller **41**, that is, leftward in FIGS. **1** and **3**. Thus, a predetermined tension is given to the intermediate transfer belt **31**.

[0032] The support roller **43** is disposed between the four primary transfer portion **32**Y, **32**C, **32**M, and **32**B and the drive roller **41** with respect to the rotational direction of the intermediate transfer belt **31**. The support roller **43** contacts the inner circumferential surface of the intermediate transfer belt **31** so as to have the intermediate transfer belt **31** rotatably stretched around it.

[0033] The four primary transfer rollers **32***r* are disposed, across the intermediate transfer belt **31**, above the four image forming portions **20**, respectively. The primary transfer rollers **32***r* are disposed, across the intermediate transfer belt **31**, opposite the photosensitive drums **21**, respectively, and contact the inner circumferential surface of the intermediate transfer belt **31** so that the intermediate transfer belt **31** is rotatably stretched around them. The primary transfer rollers **32***r* primarily transfer the toner images formed on the outer circumferential surfaces of the four photosensitive drums **21** sequentially while overlaying them on one after another to the outer circumferential surface of the intermediate transfer belt **31**.

[0034] The image forming apparatus **1** further includes a density sensor **11** and a positioning portion **12**.

[0035] The density sensor **11** is disposed downstream of the secondary transfer portion **33** with respect to the rotational direction of the intermediate transfer belt **31**, above the intermediate transfer belt **31** apart from it. The density sensor **11** faces the outer circumferential surface of the intermediate transfer belt **31** in the top-bottom direction.

[0036] The density sensor **11** comprises a reflective optical sensor (not shown) having a light emitter including a light-emitting element such as an LED (light emitting diode) and a light receiver including a light-receiving element such as a photodiode. The light emitter shines sensing light at a predetermined angle to the toner image primarily transferred to the outer circumferential surface of the intermediate transfer belt **31**. The light receiver receives the sensing light (reflected light) shone from the light emitter to the toner image and reflected from the toner image.

[0037] The density sensor **11** can output the level of the sensing light received by the light receiver as a sensed value (voltage value) of toner density, then derive the amount of toner in the toner image primarily transferred to the outer circumferential surface of the intermediate transfer belt **31**, and thereby sense the toner density of the toner image. When no toner is on the outer circumferential surface of the intermediate transfer belt **31**, the sensing light shone from the light emitter is not diffusely reflected by toner but regularly reflected, and more of it enters the light receiver. Thus, the sensed value (voltage value) of toner density is higher. The more toner there is on the outer circumferential surface of the intermediate transfer belt **31**, the more light is diffusely reflected by toner, and thus the less light enters the light receiver. In other words, the sensed value (voltage value) of toner density is accordingly lower.

[0038] In this way, the density sensor **11** shines, from the light emitter, the sensing light to the toner image and outputs the sensed value of the toner density of the toner image primarily transferred to the outer circumferential surface of the intermediate transfer belt **31** based on the sensing light reflected from the toner image and received by the light receiver; thereby it senses the toner density.

[0039] The positioning portion **12** is disposed opposite the density sensor **11**, at the inner circumferential side of the intermediate transfer belt **31**. The positioning portion **12** contacts the inner circumferential surface of the intermediate transfer belt **31** to keep a predetermined distance across the gap between the intermediate transfer belt **31** and the density sensor **11**. The positioning portion **12** includes a support member **121** and a non-woven fabric **122**.

[0040] The support member **121** is disposed at the inner circumferential side of the intermediate transfer belt **31** so as to face it. The support member **121** is made of, for example, sheet metal with a section substantially in the shape of a U as seen from the axial direction of the drive roller **41** and extends along the axial direction. A part of the support member **121** facing the inner circumferential surface of the intermediate transfer belt **31** is formed substantially in the shape of a flat plate with a facing surface extending along the movement direction of the intermediate transfer belt **31** and along the axial direction of the drive roller **41**.

[0041] The non-woven fabric **122** is laid on the surface of the support member **121** facing the intermediate transfer belt **31** so as to contact the inner circumferential surface of the intermediate transfer belt **31**. Specifically, the non-woven fabric **122** lies in surface contact with the inner circumferential surface of the intermediate transfer belt **31** along the movement direction of the intermediate transfer belt **31** and along the axial direction of the drive roller **41**. The non-woven fabric **122** has a thickness of, for example, 0.2 [mm] or more but 2 [mm] or less. The non-woven fabric **122** is electrically conductive.

[0042] Now, a practical example will be described. FIG. **4** is a graph showing the surface resistivity of an intermediate transfer belt in an image forming apparatus of a comparative example. FIG. **5** is a graph showing the change of the surface resistivity of the intermediate transfer belt **31** in the image forming apparatus **1** of a practical example. For each of the image forming apparatuses of the practical and comparative examples, an evaluation was made of the effect of the configuration of the non-woven fabric **122** in the positioning portion **12** on the change of the surface resistivity of the intermediate transfer belt **31**.

[0043] As mentioned above, in the practical example, the non-woven fabric **122** in the positioning portion **12** is electrically conductive. On the other hand, in the comparative example, the non-woven fabric **122** of the positioning portion **12** is electrically insulating.

[0044] In FIG. **4** showing the comparative example, the horizontal axis indicates the position on the intermediate transfer belt **31** along the axial direction and the vertical axis indicates the surface resistivity of the intermediate transfer belt **31**. On the intermediate transfer belt **31** of the comparative example, a region Ps that includes the area spanning between 15 and 20 [mm] from one end (position 0 [mm]) of it in the axial direction is contacted by the electrically insulating non-woven fabric **122** in the positioning portion **12**.

[0045] With the comparative example, FIG. **4** reveals that the surface resistivity in the region Ps on the intermediate transfer belt **31** is lower than around it. This suggests that contact with the electrically insulating non-woven fabric causes frictional electrification and hence dielectric breakdown in the region Ps of the intermediate transfer belt **31**, resulting in a drop in the surface resistivity.

[0046] In FIG. **5** showing the practical example, the horizontal axis indicates the cumulative number of sheets printed on the image forming apparatus **1** and the vertical axis indicates the surface resistivity of the intermediate transfer belt **31**.

[0047] With the practical example, FIG. **5** reveals that, even after printing on 600 thousand sheets, the surface resistivity of the intermediate transfer belt **31** exhibits hardly any drop. In this way, with the configuration of the embodiment, where the non-woven fabric **122** that contacts the inner circumferential surface of the intermediate transfer belt **31** is electrically conductive, it is possible to prevent change of the surface resistivity of the intermediate transfer belt **31** for a long term. It is thus possible to keep performing high-quality image formation on the image forming apparatus **1**, and prolong its service life.

[0048] Preferably, the contact pressure that acts on the support member **121** via the non-woven fabric **122** against the intermediate transfer belt **31** is 1 [N/m.sup.2] or more, the non-woven fabric **122** has a thickness of 0.2 [mm] or more in the direction in which it faces the intermediate transfer belt **31**, and has a thickness variation of 0.1 [mm] or less when it contacts the intermediate transfer belt **31**. With this configuration, the non-woven fabric **122** hardly changes its thickness under the tension of the intermediate transfer belt **31** and this helps keep constant the distance between the sensor in the density sensor **11** and the toner image on the intermediate transfer belt **31** for a long term. This makes it possible to keep performing proper density correction.

[0049] Preferably, the non-woven fabric **122** has a coefficient of dynamic friction of 0.2 or less on its contact surface with the intermediate transfer belt **31**. This configuration allows smooth sliding of the intermediate transfer belt **31** contacting the non-woven fabric **122**, preventing the non-woven fabric **122** from acting as a brake on the driving of the intermediate transfer belt **31**. It is thus possible to keep driving the intermediate transfer belt **31** smoothly even under constant contact with the non-woven fabric **122** and to keep performing high-quality image formation.

[0050] The non-woven fabric **122** also has a cleaning function, which allows removal of toner, dust, and the like adhered on the inner circumferential surface of the intermediate transfer belt **31**. This helps suppress wear of the inner circumferential surface of the intermediate transfer belt **31**. It also helps prevent toner, dust, and the like adhered on the inner circumferential surface of the intermediate transfer belt **31** from adhering to the outer circumferential surface of the drive roller **41**. This makes it possible to prevent their adverse effect on the rotation driving of the intermediate transfer belt **31** by the drive roller **41**.

[0051] Now, the configuration of a bias applying circuit around the secondary transfer portion **33** will be described in detail. FIG. **6** is a diagram illustrating the configuration of the bias applying circuit around the secondary transfer portion **33** in FIG. **3**. Note that, in the embodiment, the non-

woven fabric **122** in the positioning portion **12** has a surface resistivity of, for example, 6 [log Ω/sq.] or less. As shown in FIG. **6**, the image forming apparatus **1** includes a bias applying portion **13** and a feedback portion **14**.
[0052] The bias applying portion **13** includes a power supplying portion **131** and is electrically connected to the drive roller **41**. The bias applying portion **13** applies a secondary transfer bias to the drive roller (first support roller) **41**. The control portion **8** controls the bias applying portion **13** so that a predetermined output current I**1** is output to the drive roller **41**.
[0053] Note that the output current I**1** to the drive roller **41** includes a secondary transfer current It that flows into the secondary transfer roller **33***r* and that is necessary for secondary transfer, an influx current I**2** that flows into the support member **121** via the intermediate transfer belt **31**, and an influx current I**3** that flows into the support roller (second support roller) **43** via the intermediate transfer belt **31**.
[0054] The feedback portion **14** electrically connects the support member **121** and the support roller **43** to the bias applying portion **13**. When the secondary transfer bias is applied to the drive roller **41**, the feedback portion **14** returns, to the bias applying portion **13**, the influx currents I**2** and I**3** that have flowed from the drive roller **41** via the intermediate transfer belt **31** into the support member **121** and the support roller **43**. Moreover, the feedback portion **14** is grounded via an electrically resistive element **132**.
[0055] With the configuration described above, it is possible to suppress the shortage, caused by the influx currents I**2** and I**3** flowing into the support member **121** and the support roller **43**, of the secondary transfer current It necessary for the secondary transfer of the toner image to the sheet S. Thus, with the feedback portion **14**, an adequate secondary transfer bias can be applied. This allows high-quality image formation.
[0056] While an embodiment of the present disclosure is described herein, it is not meant to limit the scope of the present disclosure, which can thus be implemented with various modifications made without departing from the spirit of the present disclosure.

Claims

1. An image forming apparatus comprising: an intermediate transfer belt that is endless; a plurality of rollers around which the intermediate transfer belt is rotatably stretched; a density sensor that outputs a sensed value of a toner density of a toner image transferred to an outer circumferential surface of the intermediate transfer belt; and a positioning portion that is disposed opposite the density sensor, at an inner circumferential side of the intermediate transfer belt, the positioning portion contacting an inner circumferential surface of the intermediate transfer belt to keep a predetermined distance across a gap between the intermediate transfer belt and the density sensor, wherein the positioning portion includes: a support member that is disposed at the inner circumferential side of the intermediate transfer belt so as to face the intermediate transfer belt; and a non-woven fabric that is laid on a surface of the support member facing the intermediate transfer belt so as to contact the inner circumferential surface of the intermediate transfer belt, the non-woven fabric being electrically conductive.
2. The image forming apparatus according to claim 1, wherein a contact pressure that acts on the support member via the non-woven fabric against the intermediate transfer belt is 1 [N/m.sup.2] or more, and the non-woven fabric has a thickness of 0.2 [mm] or more in a direction in which the non-woven fabric faces the intermediate transfer belt, and has a thickness variation of 0.1 [mm] or less when the non-woven fabric contacts the intermediate transfer belt.
3. The image forming apparatus according to claim 1, wherein the non-woven fabric has a coefficient of dynamic friction of 0.2 or less on a contact surface thereof with the intermediate transfer belt.
4. The image forming apparatus according to claim 1, further comprising: a primary transfer

portion that is disposed upstream of the density sensor with respect to a rotational direction of the intermediate transfer belt, the primary transfer portion primarily transferring the toner image formed on an outer circumferential surface of a photosensitive drum to the outer circumferential surface of the intermediate transfer belt; a first support roller that is disposed between the density sensor and the primary transfer portion so as to have the intermediate transfer belt rotatably stretched therearound; a second support roller that is disposed between the primary transfer portion and the first support roller so as to have the intermediate transfer belt rotatably stretched therearound; a secondary transfer roller that is disposed, across the intermediate transfer belt, opposite the first support roller, the secondary transfer roller secondarily transferring the toner image primarily transferred to the outer circumferential surface of the intermediate transfer belt to a sheet passing between the secondary transfer roller and the intermediate transfer belt; a bias applying portion that applies a secondary transfer bias to the first support roller; and a feedback portion that electrically connects the support member and the second support roller to the bias applying portion such that, when the secondary transfer bias is applied to the first support roller, the feedback portion returns, to the bias applying portion, an influx current that has flowed from the first support roller via the intermediate transfer belt into the support member and the second support roller.
5. The image forming apparatus according to claim 4, wherein the feedback portion is grounded via an electrically resistive element.
6. The image forming apparatus according to claim 1, wherein the non-woven fabric has a surface resistivity of 6 [log Ω/sq.] or less.