

**Description****FIELD OF THE INVENTION AND RELATED ART**

5 The present invention relates to an image forming apparatus using an electrostatic image transfer process such as an electrostatic copying machine or a printer. More specifically, the present invention relates to an image forming apparatus comprising

- an image bearing member for carrying a developed toner image,
- transfer means contactable to a side of a transfer material remote from said image bearing member,
- 10 said transfer means urging the transfer material to said image bearing member having the toner image, and
- voltage application means for applying a voltage to said transfer means to transfer the toner image from said image bearing member to the transfer material.

15 In a known image forming apparatus wherein a toner image electrostatically formed on an electrostatic image bearing member such as an electrophotographic photosensitive member or an insulating member is electrostatically transferred onto a transfer material in the form of a sheet such as plain paper closely contacted thereto, an image transfer member in the form of a conductive and elastic transfer roller is press-contacted to the image bearing member to form a nip therebetween through which the transfer material is passed, while the transfer roller is being supplied with a bias voltage having a polarity opposite to that of the charged toner used for the development.

20 An image forming apparatus of this type is described in more detail in European Patent Application document EP-A-0 272 072; the image forming apparatus described in this document is an apparatus according to the preamble of claim 1.

The image forming apparatus of this type is advantageous over the conventional apparatus using a known corona discharger as the image transfer means, in that the transfer bias voltage is far lower, in that 25 no products as ozone nitride and the like are produced, and in that the transfer material can be conveyed stably.

However, it involves some drawbacks. In the apparatus of this type, the transfer material is advanced through the nip formed between the image bearing member and the transfer roller at the image transfer position where the transfer roller is press-contacted to the image bearing member, and the electric charge 30 is directly applied to the back side of the transfer material by the bias voltage applied to the transfer roller. The amount of charge actually applied to the transfer material significantly depends on the surface potentials of the image bearing member at the light and dark positions, in other words, the image portion and the non-image portion. This has been found through the experiments by the inventors.

The reason for this is considered to be the contrast, that is, the difference between the transfer bias 35 applied to the transfer roller and the image bearing member surface potential is larger in the non-image portion than in the image portion (in the case of a negative or reverse development). Therefore, the amount of the charge applied to the backside of the transfer material is larger in the non-image portion than in the image portion.

The transfer material having passed through the transfer position is, therefore, electrically charged by 40 the application of the transfer bias. If it is excessively charged, an electric field tending to shift the toner from the image portion to the non-image portion is produced. Particularly when the transfer material is separated from the image bearing member, the toner in the image portion is scattered to the background or non-image portion with the result of the smeared image, or remarkably contaminated background. It has empirically been confirmed that the above is particularly remarkable under low humidity conditions. The 45 reason would be that under such conditions, the electric resistance of the transfer material is so high that the electric charge does not move during the image transfer action on the transfer material, with the result of a larger potential difference between the image portion and the non-image portion.

**SUMMARY OF THE INVENTION**

50 Accordingly, it is a principal object of the present invention to provide an image transfer apparatus and an image forming apparatus using the same wherein the transfer apparatus is provided with a transfer member press-contacted to the image bearing member, wherein the amount of charge applied to the image portion of the transfer material and that applied to the non-image portion satisfy a particular condition, by 55 which the image can be transferred without the above-described drawbacks.

This object is achieved by providing the feature that the resistivity of the transfer means and the voltage applied by said voltage application means are constituted such that the electric charge applied to the transfer material by the transfer means during its transfer operation satisfy

A  $\geq$  B/2

where A, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is present, and B, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is absent.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a sectional view of an image forming apparatus suitable for incorporating the present invention.

Figure 2 is a graph of a bias voltage applied to the transfer roller vs. the current flowing during the sheet being in the nip.

Figure 3 is a sectional view of another image forming apparatus suitable for the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, there is shown a laser beam printer as an exemplary image forming apparatus suitable for the present invention. The apparatus includes an electrophotographic photosensitive member 1 in the form of a cylinder rotatable in the direction indicated by an arrow A. The axis thereof extends perpendicularly to the sheet of the drawing. An electrically conductive and elastic transfer roller 2 is press-contacted to the photosensitive member 1 to form an image transfer position. When the toner image on the surface of the photosensitive member 1 reaches the transfer position with rotation of the photosensitive member 1, a transfer material (not shown) is conveyed in the direction indicated by an arrow B from a conveying passage 4 in timed relation with the arrival of the toner image to the transfer position. By the action of the transfer bias applied to the transfer roller 2 by a power source 3, the toner image is transferred from the photosensitive member to the transfer material.

After the completion of the image transfer operation, the transfer material now carrying the toner image is further advanced in the direction B to reach an unshown image fixing station.

Around the photosensitive member 1, there are disposed a primary charger 1a for uniformly charging the surface of the photosensitive member 1, image information writing means for writing information on the charged surface, developing means 1e for forming a toner image by supplying toner 1f to the latent image by a developing roller 1g, cleaning means 1h for removing residual toner by a blade 1i and for removing residual electric charge, charge removing lamp 1j and other means necessary for the image formation. The image information writing means includes a semiconductor laser source 1b for producing a laser beam imagewise modulated, a polygonal mirror 1c and a reflection mirror 1d.

The image forming apparatus will further be described. The photosensitive member 1 is an organic photoconductor (OPC) photosensitive member having a diameter of 30 mm. This is electrically charged to -700 V by the primary charger 1a. The charged photosensitive member 1 is exposed to the image information by scanningly deflecting the modulated laser beam, by which the potential of the photosensitive member is reduced to -100 V at the portion where it is exposed to the laser beam, whereby an electrostatic latent image is formed.

Then, negative toner (electrically charged to a negative polarity) is supplied from the developing device to form a toner image on the surface of the photosensitive member 1 corresponding to the latent image, through a reverse development.

When the transfer material comes to the transfer position, a positive transfer bias is applied to the backside of the transfer material from the power source 3 by the transfer roller 2, by which the toner image is transferred to the transfer material.

The transfer roller 2 comprises a core metal 2a having a diameter of 6 mm, an inside layer 2b thereon made of EPDM rubber (terpolymer of ethylenepropylene dien) having a volume resistivity of approximately 10<sup>5</sup> ohm.cm, and an outside layer 2c thereon made of PVDF (polyvinylidene fluoride) having a thickness of 200 microns and a volume resistivity 10<sup>11</sup> ohm.cm. The outer diameter of the transfer roller 2 is 17 mm.

Figure 2 is a plot of a current flowing between the core metal 2a of the transfer roller 2 and the power source 3 vs. a bias voltage applied to the transfer roller when A4 size (Japanese Industrial Standard) transfer sheet having a width of 21 cm is longitudinally advanced at a speed of 2.4 cm/sec. A curve A shows the current when the sheet having a solid black image is passed through the nip of the transfer position, whereas a curve B shows the current when the sheet having an entirely white image is passed through the nip.

An optimum transfer efficiency which was not less than 70 %, further preferably not less than 80 % was provided when the current for the solid black image was 0.5 - 1.0 micro-ampere.

For example, when the bias voltage is 2000 V the current for the solid black image between the transfer bias voltage source and the core metal of the transfer roller is 0.8 micro-ampere, with which the image transfer operation is satisfactory, and the current for the entirely white image is 1.5 micro-ampere.

By this, the electric charge of 0,016 micro-Coulomb/cm<sup>2</sup> (= 0.81(2.4 = transfer material moving speed) x 21 (width of the transfer material)) is applied to the backside of the image portion, and the electric charge of 0,030 micro-Coulomb/cm<sup>2</sup> (1.5/(2.4x21)) is applied to the backside of the transfer material in the non-image portion. With these conditions, no toner is scattered from the image portion to the non-image portion.

For the purpose of comparison, the similar experiments have been carried out using a low resistance roller provided by removing the outside layer made of PVDF having the high electric resistance, from the above-described transfer roller 2. The results are shown in Figure 2 by the curves A' and B'.

When the bias voltage is 700 V, the current is 0.8 micro-ampere for the solid black image, by which the image transfer operation is satisfactory. However, as for the entirely white image, the current is 2.5 micro-amperes, with the result of a large difference in the electric charge applied to the image portion and the non-image portion, so that the toner is scattered from the image portion to the non-image portion.

The amount of charge applied to the backside of the transfer material is varied in the image portion and the non-image portion, and the image qualities and the degree of the toner scattering are evaluated. The results are shown in the following Table.

Table

| Charge amount in image portion ( $\mu\text{C}/\text{cm}^2$ ) | Charge amount of non-image portion ( $\mu\text{C}/\text{cm}^2$ ) | Toner scattering |
|--------------------------------------------------------------|------------------------------------------------------------------|------------------|
| 0.01                                                         | 0.04                                                             | NG               |
| 0.01                                                         | 0.03                                                             | NG               |
| 0.01                                                         | 0.025                                                            | NG               |
| 0.01                                                         | 0.2                                                              | F                |
| 0.01                                                         | 0.017                                                            | G                |
| 0.01                                                         | 0.014                                                            | G                |
| 0.02                                                         | 0.08                                                             | NG               |
| 0.02                                                         | 0.06                                                             | NG               |
| 0.02                                                         | 0.05                                                             | NG               |
| 0.02                                                         | 0.04                                                             | F                |
| 0.02                                                         | 0.03                                                             | G                |
| 0.02                                                         | 0.025                                                            | G                |

G: Image quality is good without toner scattering.  
 F: Toner is slightly scattered, but no practical problem.  
 NG: Toner is scattered to such an extent that the scattered toner is observed by eyes, and therefore, the image quality is remarkably deteriorated.

From the above, the good images without toner scattering can be provided, if the following is satisfied:

$$A \geq B/2$$

where A is the amount of electric charge applied to the backside of the transfer material in the image portion (Coulomb/cm<sup>2</sup>); and B is that at the non-image portion.

It has also been found that the volume resistivity of the outside layer of the transfer roller is preferably between 10<sup>9</sup> - 10<sup>13</sup> ohm.cm, and that the transfer bias is 1500 V - 3000 V.

Figure 3 shows another embodiment, wherein the photosensitive member 1 is the same as in the foregoing embodiment. The transfer roller 5 includes a core metal 5a having a diameter of 6 mm and a conductive urethane coating 5b having a resistivity of 10<sup>10</sup> ohm.cm, wherein the overall outer diameter is 17 mm.

With this structure, the transfer bias is selected to the 2500 V. Then, the current when the transfer sheet having the solid black image was in the nip was 0.6 micro-ampere, and the current when the sheet having

the entirely white image was 1.0 micro-ampere. The above-described requirement of  $A \geq B/2$  was satisfied between the charge amount A at the image portion and the charge amount at the non-image portion, and it was confirmed that the toner did not scatter from the image portion to the non-image portion.

In the case of this transfer roller, the good results were obtained when the resistivity of the conductive outside layer of the transfer roller is  $10^8 - 10^{12}$  ohm.cm, and the transfer bias was 1800 V - 3500 V.

In the foregoing embodiment, the transfer means is in the form of a transfer roller. The roller may be driven by driving means for the roller, or it may be rotated by the photosensitive drum.

Other possible forms of the transfer means are a belt, a brush which does not rotate or move, or may be a soft contacting and rubbing member having electric conductivity or having a low resistance.

In the foregoing embodiment, the description is made as to the reverse development. However, the present invention is applicable to a normal or positive development wherein the toner is deposited in the latent image portion. In this case, the charge amounts at the image portion where the toner is deposited on the latent image and at the non-image portion not having the toner, satisfy the above-described requirement.

As for the image forming apparatus, it may be a copying machine wherein light reflected by an original is projected onto the photosensitive member.

As described in the foregoing, the electric currents through the contact type transfer means at the portion where the surface potential of the electrostatic latent image after the development is relatively high and the portion where it is low, satisfy the above. By doing so, it can be avoided that the charge amounts of the transfer material are excessively different between the high potential portion and the low potential portion. Therefore, unpreferable movement of the toner can be avoided when the transfer material is separated.

Therefore, the image quality can be improved.

An image transfer apparatus for transferring a toner image onto a transfer material includes an image bearing member for carrying a developed toner image; image transfer bias applying roller for contacting to a backside of the transfer material, for urging it to the image bearing member having the toner image and for applying a transfer bias to transfer the toner image to the transfer material; wherein amounts of charge applied to the transfer material by the transfer bias applying roller during its transfer operation satisfy

$$A \geq B/2$$

where A (Coulomb/cm<sup>2</sup>) is an amount of the charge at a portion where a surface potential of the image bearing member is relatively low, and B (Coulomb/cm<sup>2</sup>) is an amount of the charge at a portion where the surface potential of the image bearing member is relatively high. Then, disturbance to the image by the image transfer operation can be avoided.

## Claims

### 1. An image forming apparatus, comprising:

an image bearing member (1) for carrying a developed toner image;  
transfer means (2;5) contactable to a side of a transfer material remote from said image bearing member (1), said transfer means (2;5) urging the transfer material to said image bearing member (1) having the toner image;  
voltage application means (3) for applying a voltage to said transfer means (2;5) to transfer the toner image from said image bearing member (1) to the transfer material;  
**characterized in that**  
the resistivity of the transfer means (2;5) and the voltage applied by said voltage application means (3) are constituted such that the electric charge applied to the transfer material by the transfer means (2;5) during its transfer operation satisfy

$$A \geq B/2$$

where A, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is present, and B, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is absent.

### 2. An apparatus according to claim 1, wherein said transfer means (2;5) has a rotatable member.



the entirely white image was 1.0 micro-ampere. The above-described requirement of  $A \geq B/2$  was satisfied between the charge amount A at the image portion and the charge amount at the non-image portion, and it was confirmed that the toner did not scatter from the image portion to the non-image portion.

In the case of this transfer roller, the good results were obtained when the resistivity of the conductive outside layer of the transfer roller is  $10^8 - 10^{12}$  ohm.cm, and the transfer bias was 1800 V - 3500 V.

In the foregoing embodiment, the transfer means is in the form of a transfer roller. The roller may be driven by driving means for the roller, or it may be rotated by the photosensitive drum.

Other possible forms of the transfer means are a belt, a brush which does not rotate or move, or may be a soft contacting and rubbing member having electric conductivity or having a low resistance.

In the foregoing embodiment, the description is made as to the reverse development. However, the present invention is applicable to a normal or positive development wherein the toner is deposited in the latent image portion. In this case, the charge amounts at the image portion where the toner is deposited on the latent image and at the non-image portion not having the toner, satisfy the above-described requirement.

As for the image forming apparatus, it may be a copying machine wherein light reflected by an original is projected onto the photosensitive member.

As described in the foregoing, the electric currents through the contact type transfer means at the portion where the surface potential of the electrostatic latent image after the development is relatively high and the portion where it is low, satisfy the above. By doing so, it can be avoided that the charge amounts of the transfer material are excessively different between the high potential portion and the low potential portion. Therefore, unpreferable movement of the toner can be avoided when the transfer material is separated.

Therefore, the image quality can be improved.

An image transfer apparatus for transferring a toner image onto a transfer material includes an image bearing member for carrying a developed toner image; image transfer bias applying roller for contacting to a backside of the transfer material, for urging it to the image bearing member having the toner image and for applying a transfer bias to transfer the toner image to the transfer material; wherein amounts of charge applied to the transfer material by the transfer bias applying roller during its transfer operation satisfy

$$A \geq B/2$$

where A (Coulomb/cm<sup>2</sup>) is an amount of the charge at a portion where a surface potential of the image bearing member is relatively low, and B (Coulomb/cm<sup>2</sup>) is an amount of the charge at a portion where the surface potential of the image bearing member is relatively high. Then, disturbance to the image by the image transfer operation can be avoided.

## Claims

### 1. An image forming apparatus, comprising:

an image bearing member (1) for carrying a developed toner image;  
transfer means (2;5) contactable to a side of a transfer material remote from said image bearing member (1), said transfer means (2;5) urging the transfer material to said image bearing member (1) having the toner image;

voltage application means (3) for applying a voltage to said transfer means (2;5) to transfer the toner image from said image bearing member (1) to the transfer material;

#### characterized in that

the resistivity of the transfer means (2;5) and the voltage applied by said voltage application means (3) are constituted such that the electric charge applied to the transfer material by the transfer means (2,5) during its transfer operation satisfy

$$A \geq B/2$$

where A, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is present, and B, in Coulomb/cm<sup>2</sup>, is a charge quantity per unit area at a portion of the transfer material where the toner is absent.

### 2. An apparatus according to claim 1, wherein said transfer means (2;5) has a rotatable member.



3. An apparatus according to claim 1 or 2, wherein said transfer means (2;5) has an elastic member.
4. An apparatus according to claim 1, 2 or 3, wherein said image bearing member (1) is an electrophotographic photosensitive member.
5. An apparatus according to any of the preceding claims, further comprising  
latent image forming means (1a, 1b, 1c, 1d) for forming an electrostatic latent image on said image bearing member (1), and  
developing means (1e, 1f, 1g) for developing an electrostatic latent image formed on said image bearing member (1) into a toner image with toner.
6. An apparatus according to claim 5, wherein said latent image forming means (1a, 1b, 1c, 1d) includes charging means (1a) for uniformly charging said image bearing member (1) and means (1b) for applying light information to said image bearing member (1).
7. An apparatus according to claim 5 or 6, wherein said latent image has a charge polarity which is the same as that of said toner.
8. An apparatus according to any of the preceding claims, wherein said transfer means (2;5) has an outside layer having a volume resistivity of  $10^8$ - $10^{12}$  ohm·cm.
9. An apparatus according to claim 8, wherein the voltage of said voltage application means (3) is 1800-3500 V.
10. An apparatus according to any of the preceding claims, wherein a potential difference between the potential applied on said transfer means and a surface potential of said image bearing member (1) is smaller at the toner present portion of the transfer material than at the toner absent portion of the transfer material.

### Patentansprüche

1. Abbildungserzeugungsvorrichtung mit:  
einem abbildungstragenden Element (1) zum Tragen einer entwickelten Tonerabbildung,  
einer Übertragungseinrichtung (2, 5), die mit einer Seite eines Übertragungsmaterials, das von dem abbildungstragenden Element (1) beabstandet ist, in Kontakt bringbar ist, wobei die Übertragungseinrichtung (2, 5) das Übertragungsmaterial zu dem die Tonerabbildung aufweisenden abbildungstragenden Element (1) drückt;  
dadurch gekennzeichnet, daß  
der spezifische Widerstand der Übertragungseinrichtung (2, 5) und die mittels der Spannungsanlageeinrichtung (3) angelegte Spannung derart ausgebildet sind, daß die dem Übertragungsmaterial durch die Übertragungseinrichtung (2, 5) während ihres Betriebes aufgebrachte elektrische Ladung  
$$A \geq B/2$$
  
erfüllt, wobei A eine Ladungsmenge pro Flächeneinheit in Coulomb/cm<sup>2</sup> in einem Abschnitt des Übertragungsmaterials ist, in dem der Toner vorhanden ist, und B eine Ladungsmenge pro Flächeneinheit in Coulomb/cm<sup>2</sup> in einem Abschnitt des Übertragungsmaterials ist, in dem der Toner nicht vorhanden ist.
2. Vorrichtung gemäß Anspruch 1, wobei die Übertragungseinrichtung (2, 5) ein drehbares Element aufweist.
3. Vorrichtung gemäß Anspruch 1 oder 2, wobei die Übertragungseinrichtung (2, 5) ein elastisches Element aufweist.
4. Vorrichtung gemäß Anspruch 1, 2 oder 3, wobei das abbildungstragende Element (1) ein elektrofotografisches lichtempfindliches Element ist.



5. Vorrichtung gemäß einem der vorhergehenden Ansprüche, die ferner aufweist:  
 Latentabbildungs-Erzeugungseinrichtungen (1a, 1b, 1c, 1d) zum Erzeugen einer elektrostatischen latenten Abbildung auf dem abbildungstragenden Element (1), und  
 Entwicklungseinrichtungen (1e, 1f, 1g), um eine auf dem abbildungstragenden Element (1) ausgebildete elektrostatische latente Abbildung zu einer Tonerabbildung mit Toner zu entwickeln.
6. Vorrichtung gemäß Anspruch 5, wobei die Latentabbildungs-Erzeugungseinrichtungen (1a, 1b, 1c, 1d) eine Ladeeinrichtung (1a) zum einheitlichen Aufladen des abbildungstragenden Elements (1) und eine Einrichtung (1b) zum Zuführen der Lichtinformation zu dem abbildungstragenden Element (1) aufweisen.
7. Vorrichtung gemäß Anspruch 5 oder 6, wobei die latente Abbildung eine Ladungspolarität hat, die die gleiche wie die des Toners ist.
8. Vorrichtung gemäß einem der vorangehenden Ansprüche, wobei die Übertragungseinrichtung (2, 5) eine Außenschicht hat, die einen spezifischen Widerstand von  $10^8$ - $10^{12} \Omega \cdot \text{cm}$  hat.
9. Vorrichtung gemäß Anspruch 8, wobei die Spannung der Spannungsanlegeeinrichtung (3) 1800-3500 V beträgt.
10. Vorrichtung gemäß einem der vorangehenden Ansprüche, wobei eine Potentialdifferenz zwischen dem an die Übertragungseinrichtung angelegten Potential und einem Oberflächenpotential des abbildungstragenden Elements (1) in dem Abschnitt des Übertragungsmaterials, in dem der Toner vorhanden ist, kleiner als in dem Abschnitt des Übertragungsmaterials ist, in dem der Toner nicht vorhanden ist.

## Revendications

### 1. Appareil de formation d'images, comportant :

- un élément (1) porteur d'image destiné à porter une image développée en toner ;
- des moyens (2 ; 5) de report pouvant entrer en contact avec un côté d'une matière de report éloignée dudit élément (1) porteur d'image, lesdits moyens (2 ; 5) de report sollicitant la matière de report vers ledit élément (1) porteur d'image ayant l'image en toner ;
- des moyens (3) d'application de tension destinés à appliquer une tension aux moyens (2 ; 5) de report afin de reporter l'image en toner de l'élément (1) porteur d'image sur la matière de report ;
- caractérisé en ce que  
 la résistivité des moyens (2 ; 5) de report et la tension appliquée par lesdits moyens (3) d'application de tension sont constituées de manière que la charge électrique appliquée à la matière de report par les moyens (2 ; 5) de report pendant son opération de report satisfasse

$$A \geq B/2$$

où A, en coulombs/cm<sup>2</sup>, est une quantité de charge par unité de surface à une partie de la matière de report où le toner est présent, et B, en coulombs/cm<sup>2</sup>, est une quantité de charge par unité de surface à une partie de la matière de report où le toner est absent.

2. Appareil selon la revendication 1, dans lequel lesdits moyens (2 ; 5) de report comprennent un élément rotatif.
3. Appareil selon la revendication 1 ou 2, dans lequel lesdits moyens (2 ; 5) de report comprennent un élément élastique.
4. Appareil selon la revendication 1, 2 ou 3, dans lequel ledit élément (1) porteur d'image est un élément photosensible électrophotographique.
5. Appareil selon l'une quelconque des revendications précédentes, comportant en outre  
 des moyens (1a, 1b, 1c, 1d) de formation d'une image latente destinés à former une image latente électrostatique sur ledit élément (1) porteur d'image, et  
 des moyens (1e, 1f, 1g) de développement destinés à développer avec un toner une image latente



électrostatique formée sur ledit élément (1) porteur d'image en une image en toner.

- 5 6. Appareil selon la revendication 5, dans lequel lesdits moyens (1a, 1b, 1c, 1d) de formation d'une image latente comprennent un moyen (1a) de charge destiné à charger uniformément ledit élément (1) porteur d'image et un moyen (1b) destiné à appliquer une information lumineuse audit élément (1) porteur d'image.
- 10 7. Appareil selon la revendication 5 ou 6, dans lequel ladite image latente possède une polarité de charge qui est la même que celle dudit toner.
- 15 8. Appareil selon l'une quelconque des revendications précédentes, dans lequel lesdits moyens (2 ; 5) de report comprennent une couche extérieure ayant une résistivité transversale de  $10^8$ - $10^{12}$  ohms.cm.
- 20 9. Appareil selon la revendication 8, dans lequel la tension desdits moyens (3) d'application de tension est de 1800-3500 V.
10. Appareil selon l'une quelconque des revendications précédentes, dans lequel une différence de potentiel entre le potentiel appliqué auxdits moyens de report et un potentiel de surface dudit élément (1) porteur d'image est plus petite à la partie de la matière de report où le toner est présent qu'à la partie de la matière de report où le toner est absent.