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(54) An electro-photography apparatus and a method of removing toner from such an apparatus

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Description

The present invention relates to an electro-photography apparatus such as a copier or a laser printer. It is particularly, but not exclusively, concerned with such an apparatus for generating a multi-color image.

In a multi-color laser printer, multi-color images are transferred to a printing medium, such as a paper sheet, from a transfer drum. However, it is not usual to form the images directly on such a drum. Instead, a toner transport means, such as a photosensitive belt, is used. An electrostatic image corresponding to a first color is formed on the belt, e.g., by irradiation of the belt using a laser, and toner of the first color is then transferred to the belt, and from the belt to the drum. The toner corresponding to the image of the first color is then removed from the belt, and a further image corresponding to the second color is formed, toner of the second color is applied to the belt, and again transferred to the drum. These processes are repeated until all desired colors have been transferred to the drum, to form a superposed image thereon, which may then be transferred to the recording medium.


In such an arrangement, various components need to be replaced as they are used up or become worn. For example, the developers which contain the toner may need to be replaced at regular intervals. Furthermore, the efficiency of the photosensitive belt reduces with use. Therefore, after an appropriate period, which normally corresponds to about 20,000 to 30,000 multi-color printing operations, the belt needs to be replaced. Therefore, it has been proposed that the photographic belt be mounted on a holder which can be inserted into, and removed from the main body of the electro-photography apparatus. Then, the efficiency of the belt drops, but can be replaced easily. Such arrangements have been proposed, in for example, JP-A-60-113277.

Although conventional electro-photography apparatuses have collection devices for collecting used toner, those collection devices do not succeed in entrapping all the toner, and some toner comes into contact with other parts of the apparatus, and tends to adhere thereto. Alternatively, toner escapes from the apparatus, causes pollution. This is true whether the toner is a two-component powder consisting of a mixture of a carrier and fine powered toner, or a one-component powder using powder toner containing magnetic particles.

When the photosensitive belt, or other toner transport means, is mounted on a holder which is insertable into, and withdrawable from the main body of the apparatus, it has been found that toner collects on inner surfaces of the holder. When the other transport means is removed from the holder, the inner surfaces of the holder are exposed and thus a person replacing the toner transport means with a new one may come into contact with those inner surfaces and the toner transferred. This is undesirable.

US-A-4540266 discloses a electro-photography apparatus with a removable process bit (cartridge). The cartridge contains toner and means for transporting toner for electro-photography. The cartridge is held by a holder mounted in the main body of the apparatus, which holder has an air inlet and an air outlet. In US-A-4540266, the holder is an integral part of the main body.

According to a first aspect of the present invention there is provided an electro-photography apparatus, comprising:

- a main body;
- toner transport means for transporting toner within said main body for electro-photography;
- a cartridge having said toner transport means therein;
- and a holder for supporting said cartridge mounted in said main body, said holder having an air inlet and an air outlet spaced from said air inlet; the holder removably supports said cartridge and is mounted on the main body so as to be withdrawable therefrom;
- said holder and said cartridge have opposed surfaces defining a gap therebetween; and the apparatus includes generating means for generating an air flow from said air inlet to said air outlet through said gap.

According to a second aspect of the present invention there is provided a method of removing toner from an electro-photographic apparatus, said electro-photographic apparatus including:

- a main body;
- toner transport means for transporting toner within said main body for electro-photography;
- a cartridge having said toner transport means therein;
- a holder supporting said cartridge in said main body; said holder is mounted in said main body so as to be withdrawable therefrom;

said method comprises:

causing air to pass between opposed surfaces of said holder and said cartridge to entrain said toner therein; and evacuating said air having toner entrained therein from said main body.

Thus, with the present invention, the toner transport means, such as a photosensitive belt, is mounted in a cartridge is then removably supported by the holder. The holder is then insertable into, and withdrawable from the main body of the electro-photography apparatus so that
the cartridge may be removed and hence the toner transport means removed, and a new cartridge, and hence a new toner transport means, be mounted on the holder which may be then inserted into the main body of the apparatus, to allow use thereof to re-commence. Furthermore, opposed surfaces of the cartridge and toner have a gap therebetween, and air is caused to pass through that gap, to entrain any toner. For this purpose, the holder may have an air inlet and an air outlet, which are in fluid communication with a flow generating means, such as a fan. Thus, whilst the electro-photography apparatus is in use, the flow of air between the cartridge and the holder prevents toner from collecting on inner surfaces of the holder and/or adjacent surfaces of the cartridge, so that those surfaces of the holder and cartridge are clean when the cartridge is replaced.

The present invention relates to an electro-photography apparatus incorporating such a cartridge, holder and gap, to a toner unit comprising a cartridge and holder, and to a method of removing toner by entraining it in air flow.

It should be noted that JP-A-2-214880 and JP-A-2-301774 have proposed ventilation systems for removing toner from inside the main body of an electro-photography apparatus, but were not concerned with toner within a removable holder.

The present invention is of most value when the surface of the holder exposed to the air flow is an upward-facing one, since gravity ensures that toner tends to collect on such surfaces. However, static charges on the toner sometimes cause it to adhere to other surfaces. Therefore the present invention may also be applied to those surfaces. Furthermore, the flow of air over surfaces of the cartridge also remove toner therefrom, so that the cartridge, and in particular the bottom surface of the cartridge, may be handled by the person removing it from the holder without that person coming into contact with escaped toner.

It is important, within the present invention, that the air reaching the inlet to the holder is clean. For this reason, that air preferably derives from a flow from outside the main body of the apparatus, and it is convenient if the direction of that flow is in the opposite direction to the direction in which the holder is withdrawn from the main body, since that direction is normally unobstructed.

It is sometimes necessary for other components to be mounted within the holder, such as charging means for charging the toner transport means. Then, it is important that the charging means or other compounds do not block the air flow between surfaces of the cartridge and holder, and they may therefore have openings therein for the passage therethrough of the air flow.

Thus, the present invention enables surfaces of the cartridge and holder to be kept free of toner, so that the user of the apparatus may replace the toner transport means, by replacing the cartridge, without becoming soiled by toner. This is particularly important when, for example, the electro-photography apparatus is used in an office environment.

Although the present invention was developed primarily for an electro-photography apparatus arranged for the formation of multi-color images using a photosensitive belt, it is not limited thereto. It may be applied, for example, to monochrome electro-photography apparatus, or to apparatus using toner transport means other than a photosensitive belt.

Embodiments of the present invention will now be described in detail, by way of example, with reference to the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view through an electro-photographic apparatus according to a first embodiment of the present invention;

Fig. 2 is an exploded perspective view showing a cartridge, a holder, and other parts of the apparatus, in the embodiment of Fig. 1;

Fig. 3 is a perspective view, partially in section, showing the engagement of the components of Fig. 2;

Fig. 4 is a vertical sectional view through part of the components of Fig. 3;

Fig. 5 is a plan view, partially in section, of the components of Fig. 2;

Fig. 6 is a view of part of the apparatus of Fig. 1, illustrating the flow of air through the holder; and

Fig. 7 is a longitudinal sectional view showing the withdrawal of the holder and removal of the cartridge therefrom.

In the embodiment shown in the drawings, an electronic photographic device (hereinafter referred to as a printer) has a main body 1 containing therein a cartridge 2 for toner transport means in the form of a photosensitive belt 4. The cartridge 2 has rotatable rollers 5, 6, 7 and 8 stretching and holding the photosensitive belt 4 within a casing 3 so that the belt can freely move around the rollers 5, 6, 7. Also within the casing 3, forming part of the cartridge, are a cleaning blade 9 and a shutter 10. On the bottom wall of the casing 3 are a charging window 3a, an exposure window 3b and an antistatic window 3c. The rollers 5 and 6 are located so as to provide the photosensitive belt 4 with a flat developing area, which area is exposed at the top of the cartridge 2. The rollers 6 and 7 are located so as to form a toner image transfer area at one interior end of the cartridge 2. The roller 8 is located so as to form a stable exposed area to enable the photosensitive belt 4 to be scanned and exposed.

The cleaning blade 9 is pressed onto the photosensitive belt adjacent the roller 7 to scrape toner from the photosensitive belt 4. The shutter 10 is energized by a spring (not shown) so as to move to a position covering the cleaning blade 9, that spring force moving the shutter as such that it covers the cleaning blade 9 when the cartridge 2 is removed from the main body 1. When the cartridge is in the main body 1, the shutter 10 is retracted.
against the force of the spring, so as to expose the cleaning blade 9.

The photosensitive cartridge 2 rests on a cartridge holder 11, which holder 11 is mounted on the main body 1 so that it can be inserted and removed (withdrawn) freely to facilitate the insertion and removal of the cartridge 2 for replacement or cleaning work. The cartridge holder 11 is in the form of an upwardly opening box and protruding rails 12 are provided on the side faces of both sides of the holder 11. Those rails 12 engage in corresponding grooves inside of side frames 13 of the main body 1 via a sliding element 15. Thus, the rails 12, and hence the holder 11, can slide freely.

An exposure window 11a and a corona discharging type charger 16, which can be attached and detached freely, are provided on the upwardly facing bottom wall of the holder 11. Air intake windows 11b are provided on the front of the holder 11 wall in the direction of insertion/withdrawal of the holder 11 and the internal side wall in the direction of insertion/withdrawal of the holder has a downward step therein to form a ventilation gap between it and the opposed surface of the cartridge 2 and also to provide a space for the shutter 10 to advance and retract.

The top of both sides of the casing 3 of the photosensitive cartridge 2 engage the top edges of both sides of the holder 11 so that it can be attached and detached freely. Hence, a ventilation space (gap) 17 is formed between the bottom of the cartridge 2 and the holder 11. Air flow through this space 17 then prevents any toner which reaches the bottom of the cartridge 2 from adhering thereto. Since the charger 16, on the bottom of the holder extends across the ventilation space 17, ventilation windows 16a and 16b are formed in the charger for the passage of air therethrough.

Each side of the inside of the main body side frame on both sides has a positioning guide 18, 19 to position the cartridge 2. The guides 18 and 19 each have a tilted groove to engage the shaft 5a of the roller 5, and the shaft 6a of the roller 6 which shafts 5a, 6a protrude from the cartridge 2 so that they are caught and lifted when the holder 11 is inserted into the main body 1. Thus, the cartridge 2 photosensitive belt 4 comes into contact with a developer or developers (to be described in more detail later). The positioning guide 18 which is outermost in the direction of withdrawal of the holder 11 has a larger separation from the cartridge 2 than the end of the rotation roller shaft 6a so that the shaft 6a of the roller 6 does not engage that guide 18 when the holder 11 is inserted or withdrawn and the cartridge 2 is mounted in or removed from the holder 11. On the other hand, the shaft 5a is sufficiently long for it to engage with the positioning guide 18. Further, a stopper (not shown) may be provided at the limit of movement of the holder 11, to prevent the holder 11 from falling clear of the main body 1 when it is withdrawn. Thus, the holder 11 does not have to be withdrawable so as to be pulled completely clear of the main body 1. It has to be withdrawn sufficiently to allow the cartridge 2 to be removed therefrom.

There is a waste toner discharge means 20 below the roller 7, which has a gutter 21 for receiving waste toner, which has been scraped by the cleaning blade 9 from the photosensitive belt 4. A screw 22 permits removal of waste toner which has accumulated in the gutter 21. When the holder 11 is inserted into the main body 1, the front end of the shutter 10 of the cartridge 2 is pushed by the gutter 21 so that the shutter 10 is retracted.

The shutter 10 has an antistatic window 10a and, when the shutter 10 is retracted, the position of the antistatic window 10a coincides with the antistatic window 3c formed in the casing 3 of the cartridge 2. Hence, light from an antistatic lamp 23 can irradiate the photosensitive belt 4.

An exposure unit base 24 is located below the holder 11 and a laser beam scanning exposure unit 25 is located thereon. A laser beam 25a is transmitted from the exposure unit 25 in dependence on e.g. a video signal from a host image signal generating device. The laser beam 25a passes through the exposure window 11a in the holder 11 and the exposure window 3b in the case 3 of the cartridge 2. It is then incident on the photosensitive belt 4 adjacent the roller 8 successively to form a static latent image of each color on the photosensitive belt 4.

Developers 26, 27, 28 and 29 are located facing the flat developing area of the photosensitive belt 4. Developing agent magnetic brushes on each developing roller 26a, 27a, 28a and 29a brush the surface of the photosensitive belt 4 to develop static latent images. The developer 26 uses a developing agent containing yellow (Y) toner, the developer 27 uses a developing agent containing magenta (M) toner, the developer 28 uses a developing agent containing cyan (C) toner, and the developer 29 uses a developing agent containing black (K) toner. The toner of these developers 26, 27, 28 and 29 adheres to static latent images on the photosensitive belt 4 selectively according to the corresponding color of the static latent image to form a toner image of the corresponding color.

There is a transfer drum 30 within the main body 1, which rotates with the photosensitive belt 4. The drum 30 is in contact with the toner image transfer area of the belt 4 and the toner image formed on the photosensitive belt 4 is transferred statically to the drum 30 in the toner image transfer area. A reserve charger 31, a transfer device 32 and a drum cleaner 33 are provided in the main body 1 facing the outside circumference of the drum 30.

The reserve charger 31 is a corona discharger which, when transferring a color toner image on the outside circumference of the drum 30, is energized to charge the said color toner image electrically to generate a corona discharge. The discharge case of the reserve charger 31 has ventilation windows 31a and 31b to ventilate the reserve charger 31. The transfer device
32 has two corona dischargers. One corona discharger (the leading one as the drum rotates) generates corona discharge to supply charge to the recording paper to transfer the charged color toner image to the recording paper. The other corona discharger (the trailing one) generates corona discharge to reduce charge remaining on the rear of the recording paper after a color toner image has been transferred.

The drum cleaner 33 can be made to contact or be withdrawn from the outside circumference of the drum 30. It is operated so as to be withdrawn from the drum 30 during the formation of a color toner image by transferring different color toner images from the photosensitive belt 4 to the outside circumference of the drum 30. After a color toner image on the outside circumference of the drum 30 is transferred to a recording paper, the drum cleaner 33 may be operated so as to move into contact with the outside circumference of the drum 30 to remove toner on the drum 30.

The space 34 formed between the holder 11, the photosensitive cartridge 2, to waste toner discharge means 20, the exposure unit base 24, the exposure unit 25, drum 30, and the reserve charger 31 functions as a guide place to introduce fresh air from the ventilation space 17 to the exhaustor.

The paper feeding system is located in the space below exposure unit base 24. A manual paper feeding system is provided so that recording paper is fed from a manual paper feeding tray 35. That tray 35 is pivotally mounted on the main body 1, and also acts as a flap which is opened to permit withdrawal of the holder 11. Paper removed from the tray 35 is fed to paper feeding rollers 36 by means of further paper feeding rollers 36 and 37. An automatic paper feeding system is also provided which extracts recording paper 40 stored in a paper feeding cassette 39 using the paper feeding roll 38.

A resist roll 41 is provided to adjust the transfer timing for a color toner image formed on the middle transfer drum 30 and the recording paper 40 on which a toner image is to be transferred is. It is located between the paper feeding roll 38 and transfer device 32. After the transfer timing of the recording paper 40 fed from the paper feeding roll 38 is adjusted, that recording paper is fed to the transfer device 32.

Behind the transfer device 32 are a transfer guide 42, fixing device 43 and paper discharge roll 44. A discharged paper tray for storing printed papers discharged from the paper discharge roll 44 (recording paper 40 on which a toner image is fixed) is formed on the top of the main body 1.

The exhaustor has an exhaust fan 46, ozone filter 47 and duct 48, and the end of the duct 48 extends near the reserve charger 31 and sucks air from the ventilation space 34 through the ventilation windows 31a and 31b formed in the discharge case and inside of the discharge case.

A control circuit device (not shown) to control the operation of the said color printer is provided in the printer main body 1.

The print operation will now be described.

When color printing starts, video signals to form the static latent images for each color are transmitted from the host image signal generator in the order: yellow (Y), magenta (M), cyan (C) and black (K). The laser beam scanning exposure unit 25 turns on/off the laser beam 25a in response to this video signal to expose the photosensitive belt 4. That belt 4 is charged uniformly by the charger 16, to form static latent images corresponding to each color on the photosensitive belt 4.

The static latent image corresponding to yellow color, which are formed first, are developed by the developer 26 using yellow developing agent to form a yellow toner image on the photosensitive belt 4 and that toner image is temporarily transferred to the drum 30. Then, static latent images corresponding to magenta color, which are formed next, are developed by the developer 27 using magenta developing agent to transfer another toner image over the yellow toner image formed on the drum 30. The forming and transferring of such a toner image are then repeated for cyan and black, so as to complete a full color toner image on the drum 30. While toner images are overlap transferred to the drum 30, the drum cleaner 33 is kept clear of the drum 30.

Recording paper 40, onto which the said color toner image is to be transferred, is extracted from the paper cassette 39 and carried to the resist roll 41. The resist roll 41 begins to rotate, thereby using the recording paper 40 so that the color toner image on the drum 30 is aligned with the recording paper 40 at a transfer position then the recording paper 40 moves to the transfer device 32. The transfer device 32 initiates corona discharge at the time when the recording paper 40 reaches the transfer position. This transfers statically a color toner image on the drum 30. Then, the recording paper 40, onto which a color toner image has been transferred, is separated from the drum 30, and the said color toner image is fixed on the recording paper by passing it through the fixing device 43. The recording paper 40 is then discharged onto the paper discharge tray 45.

The replacement of the photosensitive cartridge will now be explained.

When contamination and/or disorder of image has increased to the extent that the service life of the photosensitive belt 4 may be considered to have expired, the cartridge 2 must be replaced. First, the manual paper feeding tray 35 is moved to its open position and then the holder 11 together with the cartridge 2 are withdrawn from the main body 1. When the holder 11 has been pulled out by a distance of about 5 mm, the shafts 5a and 6a protruding from the cartridge 2 descend by about 2 mm along the tilted groove of the guides 18 and 19. Hence, a gap occurs between the photosensitive belt 4 and the developers 26 to 29. Simultaneously with the movement of the holder 11, the shutter 10 is pushed by spring force and moves so that it covers the cleaning blade 9, to prevent the cleaning blade 9 and any toner
Claims

1. An electro-photography apparatus, comprising: a main body (1);

toner transport means (4) for transporting toner within said main body (1) for electro-photography;
a cartridge (2) having said toner transport means therein;
a holder (11) for supporting said cartridge mounted in said main body (1), said holder having
an air inlet (11b) and an air outlet spaced from said air inlet (11b);
the holder (11) removably supports said cartridge and is mounted on the main body (1) so as to be withdrawale therethrough;
said holder (11) and said cartridge (2) have opposed surfaces defining a gap (17) therebetween;
and generating means (46) for generating an air flow from said air inlet (11b) to said air outlet
through said gap (17).

2. An apparatus according to claim 1, wherein said toner transport means (4) is a photosensitive belt.

3. An apparatus according to claim 1 or claim 2, wherein said opposed surfaces of said holder (11) and
said cartridge (2) are upward and downward facing respectively.

4. An apparatus according to any one of the preceding claims, wherein said holder (11) is withdrawable
from said main body (1) in a predetermined direction, and said generating means (46) is arranged to
generate a further air flow from the exterior of said main body (1) to said air inlet (11b) in a direction
opposite to said predetermined direction.

5. An apparatus according to any one of the preceding claims, further including charging means (16) in
said holder (11) for charging said toner transport means (4) for forming an image thereon, said charging
means (16) being located in said gap (17) and having openings (16a, 16b) therein for passage of said
air flow therethrough.

6. An apparatus according to any one of the preceding claims, wherein said main body (1) has therein:

image forming means (25) for forming an image on said toner transport means (4);
at least one developing device (26, 27, 28, 29) for developing said image; and
transfer means (30) for transferring said image from said toner transport means (4) to a recording
medium.
7. An apparatus according to any one of the preceding claims, further including an air filter (47), and wherein said generating means (46) is arranged to cause said air flow to extend from said air outlet to said air filter.

8. A method of removing toner from an electro-photographic apparatus, said electro-photographic apparatus including:

a main body (1);
toner transport means (4) for transporting toner within said main body (1) for electro-photography;
a cartridge (2) having said toner transport means (4) therein;
a holder (11) supporting said cartridge in said main body (2); said holder (11) is mounted in said main body (1) so as to be withdrawable therefrom;
said method comprises:
causing air to pass between opposed surfaces of said holder (11) and said cartridge (2) to entrain said toner therein; and evacuating said air having toner entrained therein from said main body (1).

Patentansprüche

1. Elektrophotographischer Apparat mit
einem Hauptgehäuse (1);
einer Toner-Transporteinrichtung (4) zum Transportieren von Toner innerhalb des Hauptgehäuses (1) zur Elektrophotographie;
einer Kartusche (2), die die Toner-Transporteinrichtung enthält;
einer Halteeinrichtung (11) zum Tragen der im Hauptgehäuse (1) befestigten Kartusche;
wobei die Halteeinrichtung einen Lufteinlaß (11b) und einen von diesem Lufteinlaß (11b) beabsichteten Luftauslaß aufweist;
wobei die Halteeinrichtung (11) die Kartusche herausnehmbar trägt und herausziehbar am Hauptgehäuse (1) befestigt ist;
wobei die Halteeinrichtung (11) und die Kartusche (2) einander gegenüberliegende Oberflächen aufweisen, die zwischen sich einen Zwischenraum (11) festlegen; und
einer Erzeugereinrichtung (46) zum Erzeugen eines Luftstroms vom Lufteinlaß (11b) zum Luftauslaß durch den Zwischenraum (17).

2. Vorrichtung gemäß Anspruch 1, wobei die Toner-Transporteinrichtung (4) ein photosensitives Band ist.

3. Vorrichtung gemäß Anspruch 1 oder 2, wobei die sich gegenüberliegenden Oberflächen der Halteeinrichtung (11) und der Kartusche (2) sich jeweils in Richtung nach oben und unten gegenüberstehen.

4. Vorrichtung gemäß einem der vorstehenden Ansprüche, wobei die Halteeinrichtung (11) in eine vorbestimmte Richtung aus dem Hauptgehäuse (1) herausziehbar ist und die Erzeugereinrichtung (46) angeordnet ist, um einen weiteren Luftstrom von außerhalb des Hauptgehäuses (1) zum Lufteinlaß (11b) entgegen der vorbestimmten Richtung zu erzeugen.

5. Vorrichtung gemäß einem der vorstehenden Ansprüche, weiter in der Halteeinrichtung (11) enthaltend eine Ladeeinrichtung (16) zum Laden der Toner-Transporteinrichtung (4), um darauf ein Bild herzustellen, wobei die Ladeeinrichtung (16) sich in dem Zwischenraum (17) befindet und Öffnungen (16a, 16b) zum Durchlaß des Luftstroms aufweist.

6. Vorrichtung gemäß einem der vorstehenden Ansprüche, wobei das Hauptgehäuse (1) eine Bildformeinrichtung (25) zum Herstellen eines Bildes auf der Toner-Transporteinrichtung (4);

welch Bild

wenigstens eine Entwicklereinrichtung (26, 27, 28, 29) zum Entwickeln des Bildes, und
eine Übertragungseinrichtung (30) zum Übertragen des Bildes von der Toner-Transporteinrichtung (4) zu einem Aufnahmemedium enthält.

7. Vorrichtung gemäß einem der vorstehenden Ansprüche, weiter aufweisend einen Luftfilter (47), wobei die Erzeugereinrichtung (46) so angeordnet ist, daß der Luftstrom vom Luftauslaß zum Luftfilter geführt wird.

8. Verfahren zum Entfernen von Toner aus einem elektrophotographischen Apparat, der
einem Hauptgehäuse (1);
einer Toner-Transporteinrichtung (4) zum Transportieren von Toner innerhalb des Hauptgehäuses (1) zur Elektrophotographie;
einer Kartusche (2), die die Toner-Transporteinrichtung (4) enthält; und
einer Halteeinrichtung (11) zum Tragen der Kartusche in Hauptgehäuse (2), wobei die Halteeinrichtung (11) herausziehbar im Hauptgehäuse (1) befestigt ist, aufweist;
mit den Verfahrensschritten
Bewirken eines Luftstroms zwischen den sich gegenüberliegenden Oberflächen der Halteeinrichtung (11) und der Kartusche (2) zum Mitführen von Toner; und
Abführen der Luft mit dem mitgeführten Toner aus dem Hauptgehäuse (1).

Revendications

1. Appareil électrophotographique, comprenant:
   un corps principal (1);
   un moyen (4) de transport de toner pour transporter du toner dans ledit corps principal (1) pour réaliser une électrophotographie;
   une cartouche (2) dans laquelle se trouve ledit moyen de transport de toner;
   un support (11) pour supporter ladite cartouche montée dans ledit corps principal (1), ledit support ayant une entrée (11b) d'air et une sortie d'air espacée de ladite entrée (11b) d'air;
   le support (11) supporte de manière amovible ladite cartouche et est monté sur le corps principal (1) de façon à pouvoir en être retiré; ledit support (11) et ladite cartouche (2) ont des surfaces en regard définissant entre elles un espace (17); et
   un moyen générateur (46) pour générer un courant d'air depuis ladite entrée (11b) d'air jusqu'à ladite sortie d'air via ledit espace (17).

2. Appareil selon la revendication 1, dans lequel ledit moyen (4) de transport de toner est une courroie photosensible.

3. Appareil selon la revendication 1 ou la revendication 2, dans lequel lesdites surfaces en regard dudit support (11) et de ladite cartouche (2) sont respectivement orientées vers le haut et vers le bas.

4. Appareil selon l'une quelconque des revendications précédentes, dans lequel ledit support (11) peut être retiré dudit corps principal (1) dans une direction prédéterminée, et ledit moyen générateur (46) est agencé pour générer un autre courant d'air depuis l'extérieur dudit corps principal (1) jusqu'à ladite entrée (11b) d'air dans une direction opposée à ladite direction prédéterminée.

5. Appareil selon l'une quelconque des revendications précédentes, comprenant en outre dans ledit support (11) un moyen de chargement (16) pour charger ledit moyen (4) de transport de toner pour former sur celui-ci une image, ledit moyen de chargement (16) étant situé dans ledit espace (17) et comportant des ouvertures (16a, 16b) par lesquelles passe ledit courant d'air.

6. Appareil selon l'une quelconque des revendications précédentes, dans lequel ledit corps principal (1) contient:
   un moyen (25) de formation d'image pour former une image sur ledit moyen (4) de transport de toner;
   au moins un dispositif de développement (26, 27, 28, 29) pour développer ladite image; et
   un moyen de transfert (30) pour transférer ladite image sur un milieu d'enregistrement depuis ledit moyen (4) de transport de toner.

7. Appareil selon l'une quelconque des revendications précédentes, comprenant en outre un filtre (47) à air, et dans lequel ledit moyen générateur (46) est conçu pour amener ledit courant d'air à s'étendre depuis ladite sortie d'air jusqu'au filtre à air.

8. Procédé pour retirer du toner d'un appareil électrophotographique, ledit appareil électrophotographique comprenant:
   un corps principal (1);
   un moyen (4) de transport de toner pour transporter du toner dans ledit corps principal (1) pour réaliser une électrophotographie;
   une cartouche (2) dans laquelle se trouve ledit moyen (4) de transport de toner;
   un support (11) supportant ladite cartouche dans ledit corps principal (2); ledit support (11) est monté dans ledit corps principal (1) de façon à pouvoir en être retiré;
   ledit procédé comprend les étapes consistant à:
   faire passer de l'air entre des surfaces en regard dudit support (11) et de ladite cartouche (2) pour entraîner ledit toner dans l'air; et
   évacuer dudit corps principal (1) ledit air dans lequel est entrainé du toner.