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[54] **PHOTORECEPTOR CLEANING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS OF THE DRY CLEANING AGENT TYPE**

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[52] **U.S. Cl.** ..... **355/15;** 15/1.5; 15/256.51; 118/637; 355/3 DD

[51] **Int. Cl.**[2] **G03G 21/00**

[58] **Field of Search** ..... 355/15, 3 DD; 117/17.5; 118/637; 15/1.5, 256.51

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Primary Examiner—Richard L. Moses
Attorney, Agent, or Firm—Cooper, Dunham, Clark, Griffin & Moran

[57] **ABSTRACT**

A device adapted for use with electrophotographic copying apparatus of the dry cleaning agent type which performs one cycle of copying operation while its photoreceptor makes two revolutions, with charging, exposing, developing and transfer printing being carried out during a first revolution and cleaning of the photoreceptor being carried out during a second revolution. A magnetic brush used for developing during the first revolution is diverted for removing residual toner particles from the photoreceptor during the second revolution and cooperates with a cleaning blade so as to clean the photoreceptor and recover the residual toner particles from the photoreceptor to the developing agent container.

5 Claims, 4 Drawing Figures

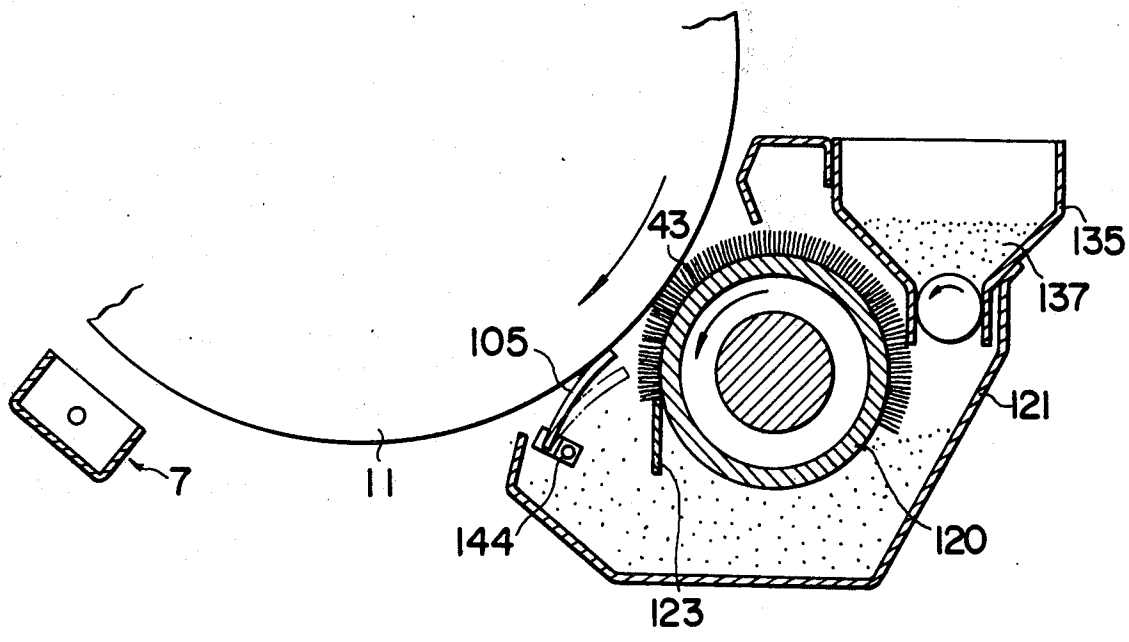


FIG. 1

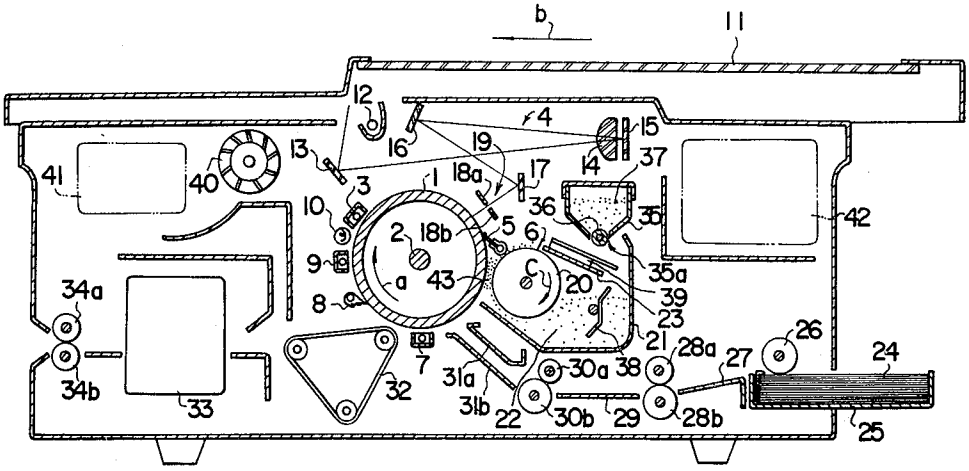

b
11
12
4
15
16
19
13
14
37
41
40
3
1
18a
17
36
35
42
10
2
18b
5
6
9
a
43
C
20
35a
39
34a
8
23
21
28a
26
24
7
31a
30a
38
27
34b
33
32
31b
22
30b
29
28b
25

FIG. 2

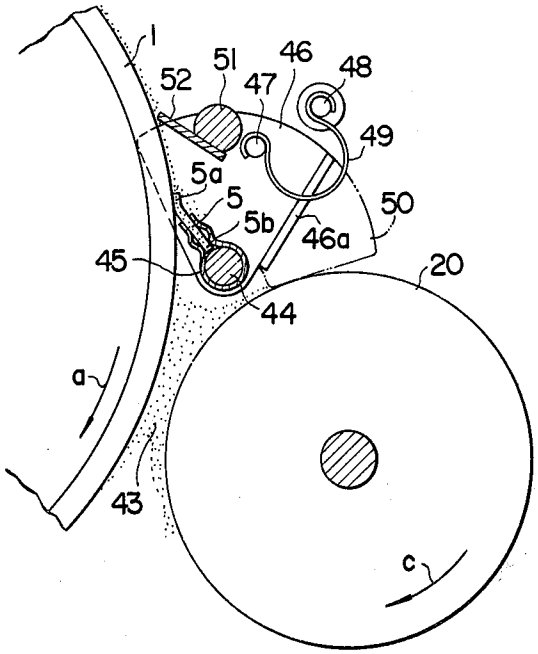

1
51
46
48
52
47
49
5a
5
5b
46a
50
45
20
44
a
43
c

FIG. 3

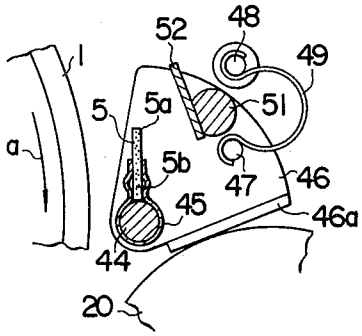
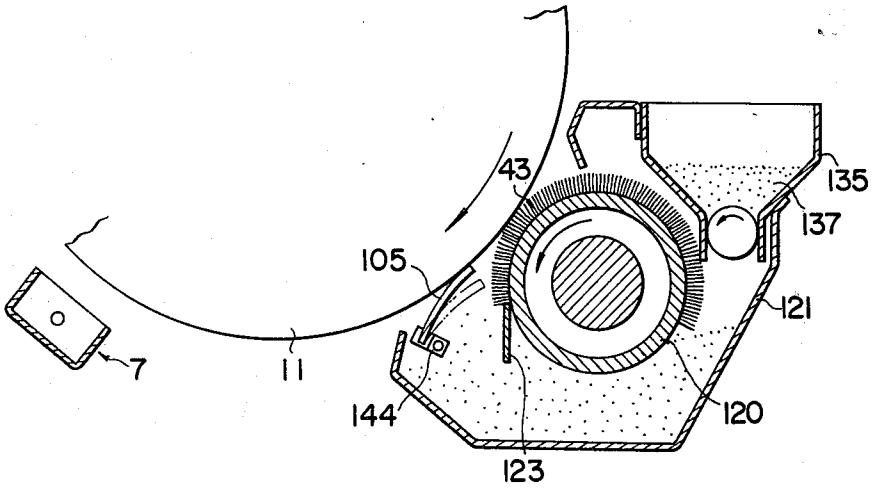

52
48
49
1
5
5a
51
a
5b
47
46
45
46a
44
20

FIG. 4


43
135
137
105
121
7
11
144
120
123

PHOTORECEPTOR CLEANING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS OF THE DRY CLEANING AGENT TYPE

BACKGROUND OF THE INVENTION

This invention relates to a photoreceptor cleaning devices, and more particularly it is concerned with photoreceptor cleaning device for electrophotographic copying apparatus of the dry cleaning agent type which performs one cycle of copying operation while its photoreceptor makes two revolutions, with charging, exposing developing and transfer printing being carried out during a first revolution and cleaning of the photoreceptor being carried out during a second revolution.

In one type of electrophotoelectric copying apparatus known in the art using as a photoreceptor a photosensitive drum or a photosensitive belt wound about the periphery of a drum, a charging device, developing device, transfer-printing device, charge removing device, cleaning device, and fatigue relieving device are arranged around the photoreceptor whereby one cycle of copying operation including charging, exposing, developing, transfer printing, charge removing, cleaning and fatigue relieving can be performed while the photoreceptor makes 1 complete revolution.

The cleaning station of the aforementioned type of electrophotographic copying apparatus is not disposed adjacent its developing station. This has made it necessary to put aside in some other position the developing agent which has been recovered by cleaning the photoreceptor. More specifically, the cleaning station is disposed anterior to the transfer-printing station in the direction of rotation of the photosensitive drum. One type of cleaning device comprises a blade and a recovery roller disposed below the blade. The blade is used for cleaning the surface of the photoreceptor while the roller is maintained in engagement with or spaced apart from the surface of the photoreceptor a small distance and rotated at least during the time the blade is performing a cleaning operation or the photoreceptor is rotating, so that the developing agent removed by the cleaning operation from the photoreceptor is moved to the surface of the roller. Another type of cleaning device comprises a cleaning agent which is used for wiping the photoreceptor to thereby remove the developing agent from the photoreceptor.

The latter type is not economical because the toner particles contained in the developing agent removed from the photoreceptor are discarded together with the carrier, thereby increasing the consumption of toner. The former type requires a large container for storing therein the toner particles of the developing agent removed from the photoreceptor. The toner particles recovered in this way have to be returned, either manually or by using an automatic conveyor means, to the developing station.

In addition, cleaning devices of the prior art have the disadvantage of the recovered toner particles scattering and soiling the adjacent parts when recovered. As aforementioned, some means is required to return the recovered toner particles to the developing station because the developing station is remote from the cleaning station. It would thus be possible to obviate the aforementioned disadvantages of the prior art if the cleaning station were disposed adjacent the developing station so that the recovered toner can be directly returned to the developing station.

This arrangement is not possible, however, in a copying apparatus wherein one cycle of copying operation is performed while the photoreceptor makes one revolution. If the developing station were disposed adjacent the cleaning station in such apparatus, an electrostatic latent image formed by exposing the photoreceptor to an optical image of an original or a toner image formed by developing the latent image into a visible image would be wiped away and no duplicate of the original could be produced.

In order to obviate the disadvantages of the prior art, it is proposed in the present invention to make the photoreceptor rotate twice while one cycle of operation is performed, with charging, exposing, developing and transfer printing being carried out during a first revolution and cleaning of the photoreceptor being carried out during a second revolution. If the electrophotographic apparatus could be made to operate as aforementioned, it would be possible to arrange the cleaning station to be disposed adjacent the developing station.

On the otherhand, in case a well-known magnetic brush is used as a means for developing a latent image with a dry developing agent, a magnetic brush formed on a magnetic drum by a dry developing agent attracted thereto supplies the dry developing agent to the photoreceptor when there is an electrostatic latent image formed thereon but merely slides along the surface of the photoreceptor when no electrostatic latent image is formed thereon. Thus, the surface of the photoreceptor is wiped clean by the brush.

SUMMARY OF THE INVENTION

This invention has as its object the provision of a photoreceptor cleaning device for electrophotographic copying apparatus of the dry cleaning agent type using a magnetic brush for developing which performs one cycle of copying operation while its photoreceptor makes two revolutions, with charging, exposing, developing and transfer printing being carried out during a first revolution and cleaning of the photoreceptor being carried out during a second revolution, such cleaning device comprising a blade disposed in the vicinity of the magnetic brush and adapted to clean the surface of the photoreceptor by removing the residual developing agent therefrom and automatically returning the same to the developing device, the magnetic brush being effective to slide along the surface of the photoreceptor after the operation of the blade is completed so as to remove therefrom any developing agent which might otherwise remain thereon.

The outstanding characteristic of the invention is that the cleaning device is disposed within or in the vicinity of the developing device of an electrophotographic copying apparatus comprising a photoreceptor adapted to make 2 revolutions while one cycle of copying operation is performed. This offers many advantages. The toner particles removed from the surface of the photoreceptor by the cleaning device can be automatically returned to the developing device for reuse. The provision of the cleaning device in the vicinity of the developing device eliminates the need to use a conveyor means for conveying to the developing device the toner particles recovered from the photoreceptor by cleaning. This makes it possible to obtain an overall compact size in an electrophotographic copying apparatus, to

simplify the construction of such apparatus and to reduce its cost.

An additional feature of the invention is that the magnetic brush used for developing is divered for use as a cleaning agent when cleaning of the photoreceptor is performed, thereby enabling to remove from the photoreceptor any toner particles which might otherwise remain thereon after cleaning is carried out by the blade. Since the blade is disposed above the magnetic brush, any toner which may drop from the blade is deposited on the magnetic brush, thereby preventing scattering of toner particles and soiling of the adjacent parts by the dropping toner particles.

Preferably, the cleaning blade is made of a material of low electric insulation, so that the residual charge on the photoreceptor can be made to escape through the cleaning blade when the latter is brought into contact with the former, thereby permitting the residual charge on the photoreceptor to be lowered to facilitate cleaning of the photoreceptor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of an electrophotographic copying apparatus in which one embodiment of this invention is incorporated;

FIG. 2 is a side view showing means for bringing the cleaning blade into and out of engagement with the drum;

FIG. 3 is a view showing the operation of the means shown in FIG. 2; and

FIG. 4 is a sectional view of the essential portions of another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before describing the invention, an electrophotographic copying apparatus of the dry developing agent type in which the invention can be incorporated will first be outlined. In FIG. 1, there is shown a photoreceptor in the form of a photosensitive drum **1** mounted on a shaft **2** driven by a drive source (not shown) to rotate the photosensitive drum **1** in the direction of an arrow *a* at a predetermined rate. One cycle of copying operation is performed while the photosensitive drum **1** makes two revolutions, with charging, exposing, developing and transfer printing being carried out during a first rotation and cleaning of the photosensitive drum being carried out during a second revolution. Disposed around the periphery of the photosensitive drum **1** is a charging device **3**, exposing device **4**, cleaning blade **5**, developing device of the magnetic brush type **6**, transfer-printing device **7**, sheet stripping device **8**, charge removing device **9** and fatigue relieving device **10** arranged in the direction of rotation of the photosensitive drum **1** in the indicated order. The charging device **3**, exposing device **4**, developing device **6**, transfer-printing device **7**, sheet stripping device **8**, charge removing device **9** and fatigue relieving device **10** all cooperate with the photosensitive drum to perform an electrophotographic copying operation during the first revolution of the drum while the cleaning blade **5** performs cleaning of the surface of the drum during its second revolution with the magnetic brush of the developing device **6** acting as a cleaning agent when cleaning is carried out.

The process of electrophotographic copying will now be described. As the photosensitive drum **1** rotates, the entire surface of the drum is uniformly charged by the charging device **3**. Then the charged surface of the photosensitive drum **1** is exposed to an optical image of an original to be duplicated by the exposing device **4** which is of the original moving type and slit exposure system in this embodiment. Alternatively, an exposing device of the optical system moving type and slit exposure system may be employed. The exposing device of the type shown comprises, as is well known, a transparent original support member **11** moving in the direction of an arrow b in synchronism with the movement of photosensitive drum **1**, a light source **12** for illuminating the original resting on the original support member **11**, and a slit **19** formed by a reflector **13**, lens **14**, reflectors **15, 16, 17** and diaphragm members **18***a*, 18*b* through which the light from the original is incident on the charged surface of the photosensitive drum **1** to expose the same to an optical image of the original. Al electrostatic latent image of the original is formed on the surface of the photosensitive drum **1** in this way.

The electrostatic latent image is developed with a dry developing agent by the developing device **6** as the photosensitive drum **1** further rotates. The developing device **6**, which is of the magnetic brush type as aforementioned, comprises a non-magnetic sleeve **20** having built therein a magnet (now shown) and driven to rotate in the direction of an arrow *c* at a predetermined rate, and a container **21** containing therein a developing agent **22**. The non-magnetic sleeve **20** supplies the developing agent **22** in the container **21** to the electrostatic latent image on the photosensitive drum **1** to develop the same into a visible toner image by the toner particles in the developing agent **22**. The developing agent remaining on the non-magnetic sleeve **20** is scraped off the sleeve **20** into the container **21** by a scraping plate **23**.

The visible toner image formed on the photosensitive drum **1** is printed on a transfer-printing copy sheet **24** by the transfer-printing device **7**. Such copy sheet **24** is one of a number of sheets cut beforehand from a strip or web in a predetermined size and stored in a cassette one on another. A stack of copy sheets is piled on a sheet feed tray **25**, and the uppermost sheet is delivered by a sheet feed roller **26** to a guide plate **27**, from which it is delivered by a pair of conveyor rollers **28***a*, 28*b* to a guide plate **29**, from which it is further delivered by a pair of conveyor rollers **30***a*, 30*b* and guide plates **31***a*, 31*b* to a portion of the surface of the photosensitive drum **1** on which the visible toner image is formed. The visible toner image is printed on the copy sheet **4** by the transfer printing device **7**.

The two pairs of conveyor rollers **28***a*, 28*b* and **30***a*, 30*b* of the sheet feed mechanism rotate in synchronism with the rotation of the photosensitive drum **1**, while the sheet feed roller **26** of the mechanism is adapted to make a complete revolution at regular intervals so as to deliver the uppermost sheet from the pile of sheets **24**. The copy sheet fed by the sheet feed roller **26** is adapted to have its leading end nipped by the pair of conveyor rollers **28***a*, 28*b*, and the sheet **24** nipped by the conveyor rollers **28***a*, 28*b* is pulled out of the pile of sheets as the rollers **28***a*, 28*b* rotate. Thus, when the sheet feed roller **26** completes its one revolution, it rotates as the sheet is pulled out by the rollers **28***a*, 28*b*.

The copy sheet **24** on which the visible toner image is printed by transfer printing from the surface of the photosensitive drum **1** is stripped from the photosensi-

tive drum by pick-off claw means **8** and delivered by a conveyor means **32** to a fixing device **33**, where the toner image is fixed to the copy sheet **24** and discharged from the apparatus to outside by a pair of discharge rollers **34***a*, **34***b*. On the other hand, the electric charge on the surface of the photosensitive drum **1** is removed by the charge removing device **9**, and then the photosensitive drum **1** is relieved of fatigue by the fatigue relieving device **10**. Thus, as the photosensitive drum **1** makes one complete revolution, one duplicate of the original is produced.

As can be clearly understood from the description of the electrophotographic apparatus set forth above, the toner particles in the developing agent **22** in the container **21** of the developing device grow smaller in quantity as each copy sheet is printed. The developing agent **22** used in the developing device **6** of the dry developing agent type consists of toner particles for forming a visible image, and a carrier adapted to supply the toner particles to the electrostatic latent image on the photosensitive drum. The carrier is adapted to be attracted by the magnet in the non-magnetic sleeve **20** to form a magnetic toner brush on the surface of the sleeve **20** so as to deliver the toner particles to the electrostatic latent image. The carrier is scraped off the surface of the sleeve **20** and returned to the container **21** after the toner particles are supplied to the drum **1**. Thus, it is the toner particles alone which grow smaller in quantity as the copying operation is repeated.

An additional supply of toner particles is delivered through a hopper **35** disposed above the developing agent container **21**. In addition to the hopper **35**, the toner supply device comprises a toner supply roller **36** disposed in an outlet port **35***a* formed at the bottom of the hopper **35**. The roller **36** is rotated at a suitable time to deliver a fresh supply of toner through the outlet port **35***a* into the container **21**. The toner particles delivered to the container **21** in this way are agitated by agitating blades **38** in the container **21** and mixed with the carrier.

After developing is completed, the developing agent remaining on the sleeve **20** is scraped off the sleeve by the scraping plate **23** and returned to the container **21** while being agitated by an agitator **39** on the scraping plate.

In FIG. **1**, **40** designates a fan for cooling the interior of the copying apparatus, **41** a drive source, and **42** an electric equipment.

One form of the copying apparatus in which the invention can be incorporated is constructed as aforementioned. A duplicate of an original is produced while the photosensitive drum **1** makes one complete revolution, and the surface of the photosensitive drum **1** is cleaned by cleaning device according to the invention while the drum **1** makes another complete revolution.

The cleaning device according to the invention will now be described in detail. As shown in FIG. **2**, the cleaning device comprises a cleaning blade **5** made of a resilient material having a forward end portion **5a** maintained in light engagement with a portion of the surface of the photosensitive drum **1** which is disposed above a portion of the surface of the photosensitive drum **1** with which the magnetic brush **43** is brought into engagement, and a cleaning magnetic brush for removing from the drum surface the toner particles still remaining thereon after cleaning is performed by the cleaning blade **5**. The magnetic brush **43** used for developing is diverted for use as a cleaning magnetic brush. Thus, the magnetic brush **43** acts as a developing magnetic brush when there is an electrostatic latent image on the surface of the photosensitive drum **1** or during the first revolution of the drum **1**, and as a cleaning magnetic brush when there is no electrostatic latent image on the surface of the drum **1** or during the second revolution thereof.

The cleaning blade **5** disposed immediately above a portion of the magnetic brush **43** which is brought into contact with the surface of the drum **1** is made of a resilient material, e.g. rubber or polyurethane foam, which does not damage the drum surface and in the form of a bar extending along the support shaft **2**. The blade **5** has a base portion **5***b* at one end disposed opposite to the forward end portion **5***a* lengthwise thereof and positioned against the periphery of a shaft **44** disposed parallel to the support shaft **2** for the drum **1**. The base portion **5***b* is wrapped by a resilient plate **45** wound on the shaft **45**, so that the blade **5** is supported by the shaft **44** and acts as a unit therewith. The forward end portion 5a of the cleaning blade **5** is maintained in engagement with the portion of the surface of the drum **1** which is disposed above the portion of the drum **1** with which the magnetic brush **43** is brought into engagement with the surface of the drum **1** as aforementioned. The shaft **44** is rotatably supported at opposite ends thereof by side walls (not shown) of the developing agent container **31** (see FIG. **1**), and extends out of the apparatus at one end portion. Thus, by turning the one end portion of the shaft **44** extending out of the apparatus, it is possible to bring the cleaning blade **5** forward end portion **5***a* into and out of engagement with the surface of the drum **1**.

The range of rotation of the shaft **44** is limited by a segmental stopper **46** affixed at its base to the shaft **44** and having affixed to its free end portion a pin **47**. A loop spring **49** tending to expand is mounted between the pin **47** and a pin **48** affixed to one of the side walls of the developing agent container **21** (See FIG. **1**). The loop spring **49** operates such that when the pin **47** moves rightwardly (in FIG. **2**) of the imaginary line connecting the pin **48** with the shaft **44** it causes by its resilience the stopper **46** to move in pivotal movement clockwise about the center axis of the shaft **44** to a predetermined position shown in FIG. **3**, and that when the pin **47** moves leftwardly (in FIG. **3**) of the imaginary line it causes by its resilience the stopper plate **46** to move in pivotal movement counter clockwise about the center axis of the shaft **44** back to its position shown in FIG. **2**. The positions in which the stopper **46** stops when moving clockwise and counter clockwise about the shaft **44** are fixed by a window **50** formed in one of the side walls of the developing agent container **21**. The window **50** receives therein a bent portion **46***a* formed at one edge of the stopper **46**, so that the range of pivotal movement of the stopper **46** is limited by the range of pivotal movement of the bent portion **46***a* in the window **50**.

One of the reasons why the cleaning blade **5** is detachably mounted on the shaft **44** relative to the photosensitive drum **1** is because the photosensitive drum **1** of the copying apparatus in which the invention is incorporated is detachably mounted on the shaft **2** and can be moved axially thereof for cleaning and repair, if necessary. Thus, if the cleaning blade **5** were not detachably mounted, its forward end portion 5a would

obstruct the movement of the drum **1** into and out of the apparatus. Another reason is that, since the forward end portion **5***a* of the cleaning blade **5** is preferably maintained in engagement with the surface of the drum **1** with a light force, the arrangement in which the cleaning blade **5** is detachably supported by the shaft **44** in cooperation with the stopper **46** and loop spring **49** serves this purpose.

The stopper **46** has affixed thereto a shaft **51** which in turn has affixed thereto a member **52** of small thickness made of Mylar or other synthetic resinous material. The member **52** of small thickness is intended to keep the toner particles scraped off the drum surface by the cleaning blade **5** from scattering in all directions and moving upwardly.

The cleaning device according to the invention constructed as aforementioned operates as follows. As the photosensitive drum **1** makes its second revolution, the residual toner particles on the surface of the drum **1** are removed by the forward end portion **5***a* of the cleaning blade **5.** At this time, the charge carried by the surface of the drum **1** has already been removed by the charge removing device **9** and the toner particles do not adhere to the surface of the drum **1,** so that they merely float on the drum surface. Thus, no resistance is offered to the cleaning blade by the residual toner particles when the former is operated to remove the latter. The removed toner particles drop on to the sleeve **20** or directly into the developing agent container **21.**

The residual toner particles which still remain on the surface of the drum **1** after the cleaning blade **5** is operated are removed by the cleaning magnetic brush **43** which slides along the drum surface as the photosensitive drum **1** rotates. In this way, the surface of the photosensitive drum **1** is cleaned and ready for the next copying operation when the drum has completed two revolutions.

In the embodiment shown and described above, the cleaning blade is disposed above the magnetic brush **43.** Alternatively, a blade **105** may be disposed below the magnetic brush **43** as shown in FIG. **4.** When the blade **105** is disposed below the magnetic brush **43** as shown, the blade **105** must be brought out of engagement with the surface of a drum **11** when the latter makes its first revolution. If the blade **105** were maintained in engagement with the surface of the drum **11,** a toner image formed on the surface of the drum **11** in the first revolution of the drum would be destroyed. In the embodiment shown, the blade **105** pivotally supported by a shaft **144** is adapted to be brought into engagement with the drum surface when a cleaning operation is performed and out of engagement therewith when no cleaning operation is performed by the action of a solenoid or the like. The embodiment constructed as aforementioned can achieve the same results as the embodiment shown in FIG. **2** and FIG. **3.** The embodiment shown in FIG. **4** requires no toner scattering preventing member. In this embodiment, a sleeve **120** mounted in a developing agent container **121** to which a fresh supply of toner particles **137** is delivered through a hopper **135** rotates in an opposite direction to the rotation of the counterpart of the embodiment shown in FIG. **2.** Accordingly, a scraper **123** is disposed in a position opposite to that of the counterpart of the embodiment shown in FIG. **2.**

Preferably, the blade **105** is made of a material low in electric insulation, so that the residual charge on the photosensitive drum **11** can be made to escape through the cleaning blade to lower the level of residual charge while scraping the residual toner particles off the drum. On the other hand, since the blade **5** of the embodiment shown in FIG. **2** is maintained in pressing engagement with the photosensitive drum **1** at all times, the blade **5** is preferably electrically insulating to a degree such that no deleterious influences are exerted on the electrostatic latent image formed on the photosensitive drum. The results of experiments show that the specific resistance of the blade **5** is over 10^{10} Ω cm. If this value is suitably reduced, it is possible to eliminate the occurrence of background density in a copy sheet because the surface potential of non-image portions of the photosensitive drum **1** is reduced, although it has deleterious effects on the electrostatic latent image to a certain extent.

The photosensitive drum can also be cleaned by impressing on the drum a bias voltage of the nature such that the residual toner particles are removed therefrom.

It is to be understood that a photosensitive belt may be used and wound on the periphery of a drum in place of using a photosensitive drum.

What is claimed is:

1. In electrophotographic copying apparatus of the dry toner image transfer type, in combination,

a. a photoreceptor unidirectionally movable along a closed endless path and undergoing two complete revolutions around said path during each cycle of copying operation; and

b. means, disposed in succession along said path so as to be traversed successively by said photoreceptor during each complete revolution thereof around said path, for erasing charge from said photoreceptor, charging said photoreceptor, exposing said photoreceptor in charged condition to form an electrostatic latent image thereon, developing the electrostatic latent image on said photoreceptor, and transfer printing the developed image;

wherein the improvement comprises:

c. said charging, exposing, and transfer printing means comprising means for charging said photoreceptor, forming a latent image thereon and transfer printing a developed image only once in each cycle of copying operation, during only the first of the two successive revolutions of said photoreceptor around said path constituting said cycle, and being inoperative during the second of said two successive revolutions constituting said cycle;

d. said erasing means comprising means for erasing charge from said photoreceptor at least during the second of said two successive revolutions of said photoreceptor such that said photoreceptor traverses said developing means in charged condition during said first revolution and in charge-erased condition during said second revolution in each cycle of copying operation; and

e. said developing means comprising a magnetic brush for transferring dry toner particles to said photoreceptor to develop an electrostatic latent image thereon when said photoreceptor traverses the developing means in charged condition and for removing residual toner particles from said photoreceptor to clean said photoreceptor when said photoreceptor traverses the developing means in charge-erased condition, such that said magnetic

brush develops an image on the photoreceptor during the first, and cleans the photoreceptor during the second, of the two successive revolutions of the photoreceptor constituting one cycle of copying operation.

2. Apparatus as defined in claim **1** further comprising a blade means disposed anterior to said magnetic brush and having its forward end portion brought into pressing engagement with the surface of the photoreceptor at least during the second revolution for aiding the cleaning by the magnetic brush.

3. Apparatus as defined in claim **2** wherein said blade means is comprised of a material having some electrical conductivity for removing residual potential from the photoreceptor when in pressing engagement therewith.

4. Apparatus as defined in claim **1** further comprising a blade means disposed posterior to the magnetic brush, and having its forward end portion brought out of engagement with the surface of the photoreceptor during the first revolution and into pressing engagement therewith during the second revolution, for finishing the cleaning by the magnetic brush.

5. Apparatus as defined in claim **1**, further including

a. means for holding a supply of developing agent including dry toner particles in position for pickup of the developing agent by the magnetic brush; and

b. a blade disposed adjacent said magnetic brush for contact with the photoreceptor to scrape toner particles from the surface thereof;

c. said holding means being so positioned that toner particles scraped from the photoreceptor by said blade fall into said holding means in position for pickup by said magnetic brush.

* * * * *