

June 22, 1965

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3,190,198

XEROGRAPHIC CLEANING APPARATUS

Filed Dec. 23, 1960

5 Sheets-Sheet 1

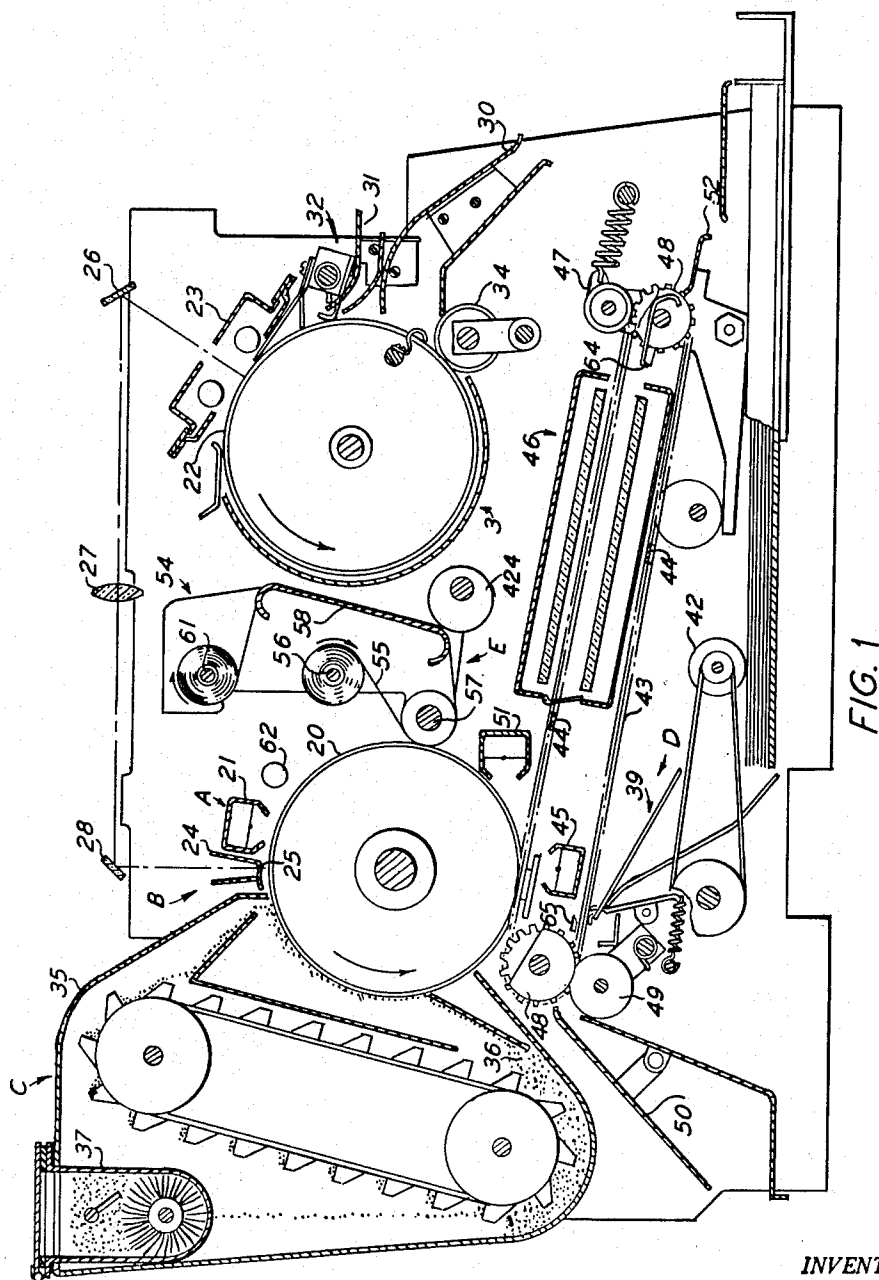


FIG. 1

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5 Sheets-Sheet 2

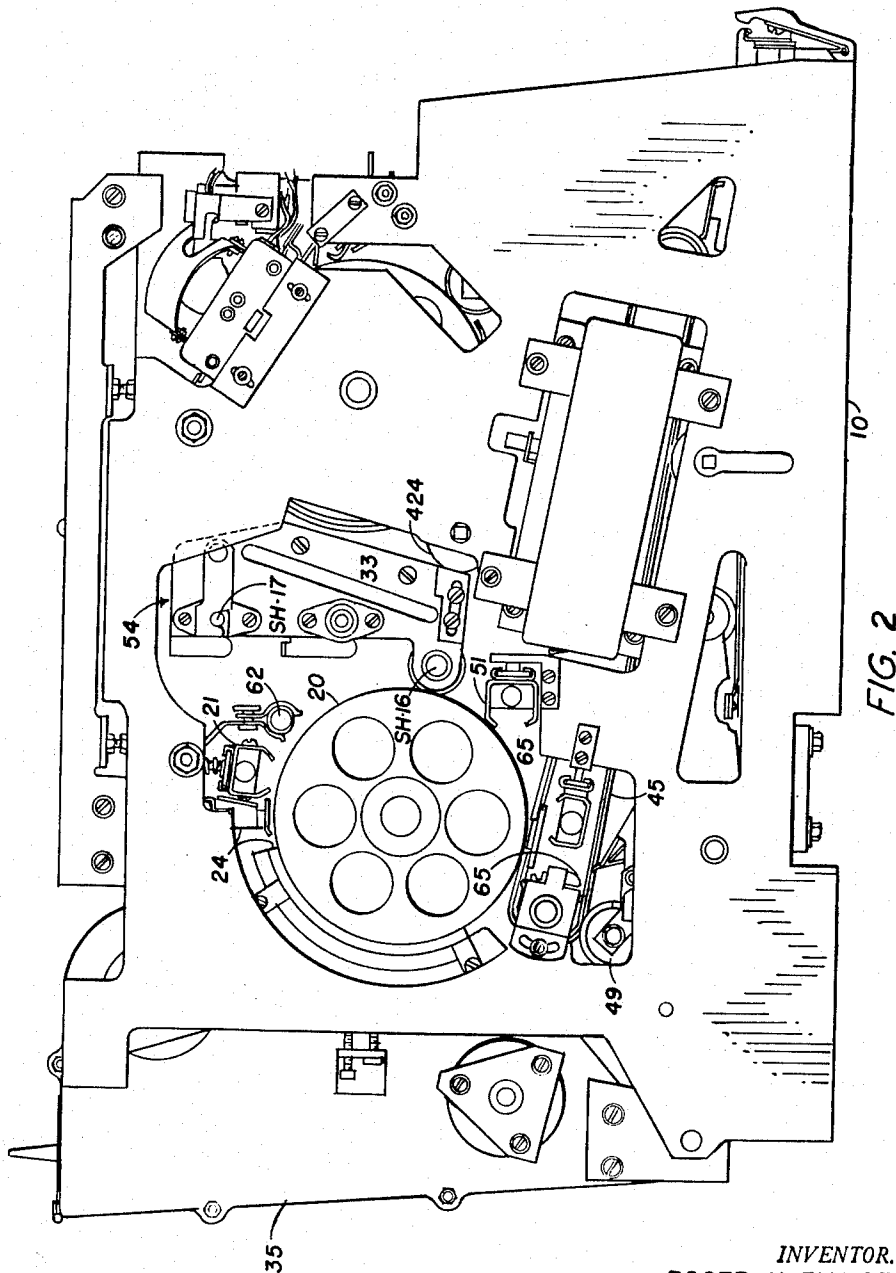


FIG. 2

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XEROGRAPHIC CLEANING APPARATUS

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5 Sheets-Sheet 3

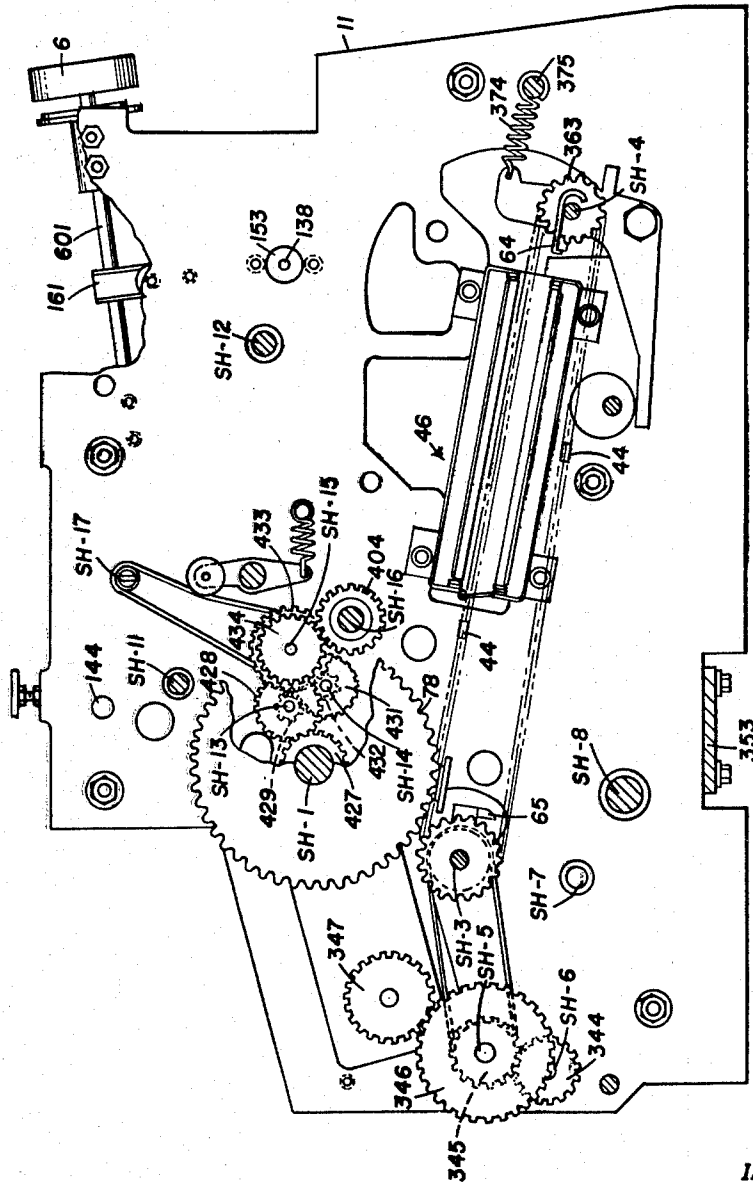


FIG. 3

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XEROGRAPHIC CLEANING APPARATUS

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5 Sheets-Sheet 4

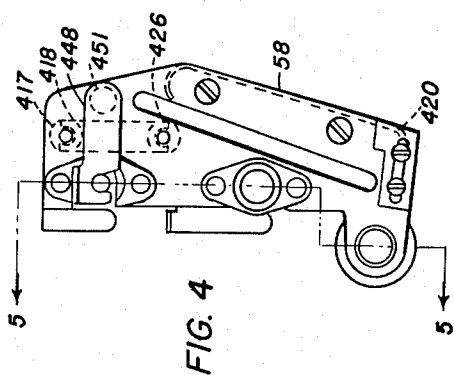


FIG. 4

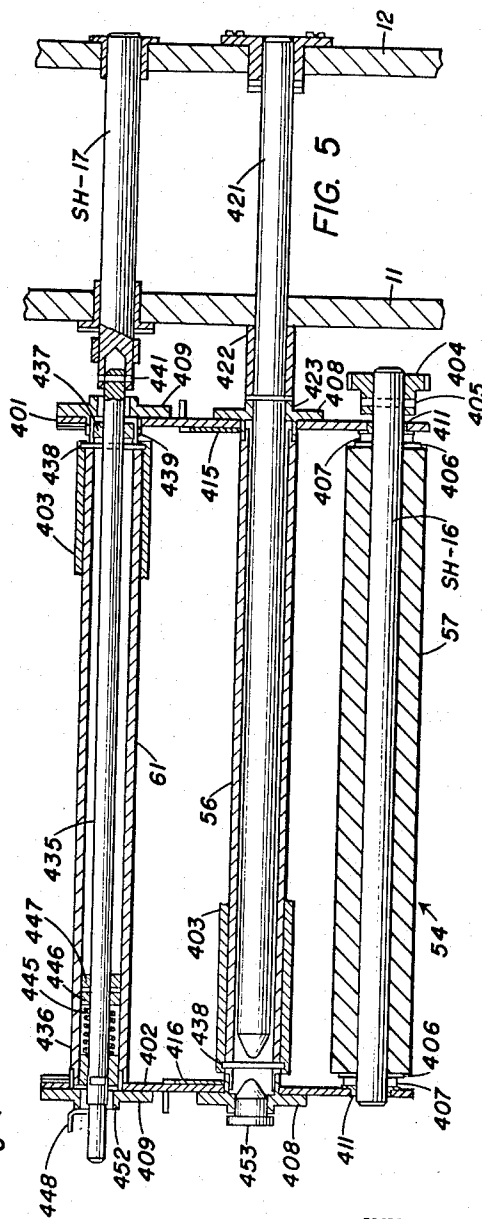


FIG. 5

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XEROGRAPHIC CLEANING APPARATUS

Filed Dec. 23, 1960

5 Sheets-Sheet 5

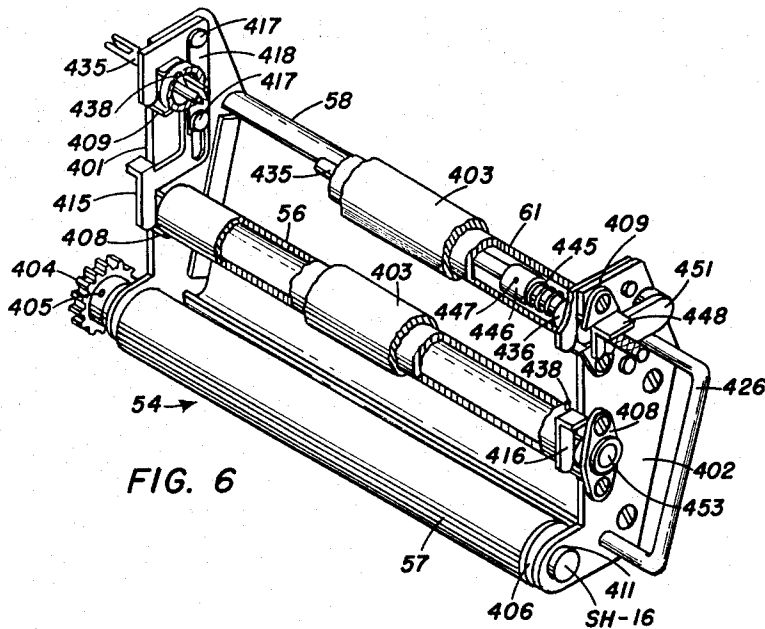


FIG. 6

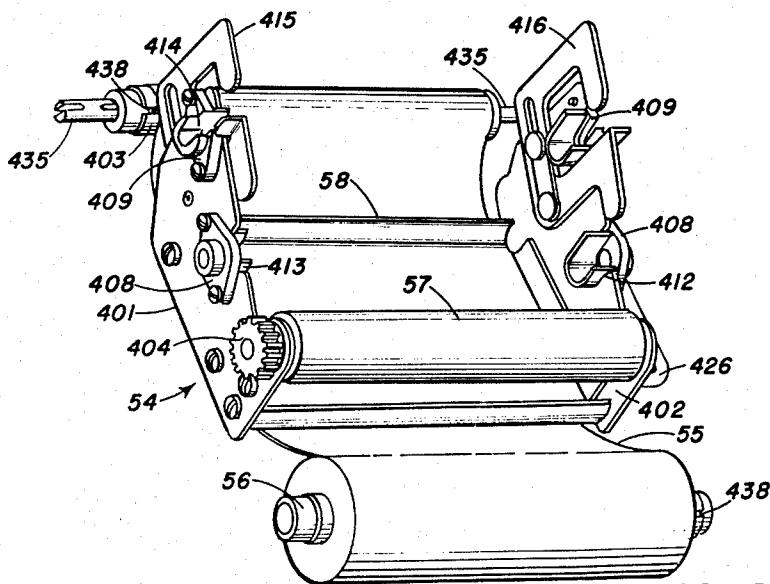


FIG. 7

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3,190,198

XEROGRAPHIC CLEANING APPARATUS

Roger H. Eichorn, Webster, N.Y., assignor to Xerox Corporation, a corporation of New York
Filed Dec. 23, 1960, Ser. No. 77,922
4 Claims. (Cl. 95—1.7)

This invention relates to xerography and, particularly, to apparatus for cleaning the surface of a xerographic plate from which a powder image has been transferred. More specifically, the invention relates to apparatus for removing a residual powder image from a xerographic plate which remains on the plate after transfer of a powder image from the plate to a support surface.

In the process of xerography, for example, as disclosed in Carlson Patent 2,297,691, issued October 6, 1942, a xerographic plate comprising a layer of photoconductive insulating material on a conductive backing is given a uniform electric charge over its surface and is then exposed to the subject matter to be reproduced, usually by conventional projection techniques. This exposure discharges the plate areas in accordance with the radiation intensity that reaches them and thereby creates an electrostatic latent image on or in the photoconductive layer. Development of the latent image is effected with an electrostatically charged, finely divided material such as an electroscopic powder that is brought into surface contact with the photoconductive layer and is held thereon electrostatically in a pattern corresponding to the electrostatic latent image. Thereafter, the xerographic powder image is usually transferred to a support surface to which it may be fixed by any suitable means.

The cycle above described is typical for forming xerographic reproductions on a support surface and may be carried out manually, or automatically, as is done with mechanized equipment which performs the cycle repeatedly. In either case, however, after transfer of a powder image from a plate to a support surface, there usually remains on the plate a residual of unremoved developing powder usually in image configuration and referred to in the art as "a residual powder image." Before the plate can be reused for a subsequent cycle it is necessary to remove the residual image to prevent "ghost images" from subsequently reproducing.

In automatic xerographic equipment it is common to employ a xerographic plate in the form of a cylindrical drum which is continuously rotated through the cycle of sequential operations including charging, exposure, developing and transfer during which copy is reproduced on a support surface and after which the plate is cleaned before repeating the cycle.

It is usual to charge the plate with corona of positive polarity by means of a corona generating device of the type disclosed in Walkup Patent 2,777,957, which is connected to a suitable source of high potential. Development of an electrostatic latent image forms a powder image on the plate which is electrostatically transferred to a support surface by means of a corona generating device such as mentioned above. In the automatic type of equipment employing a rotating drum, a support surface to which a powder image is to be transferred is moved through the equipment at the same rate as the periphery of the drum and contacts the drum at the transfer position interposed between the drum surface and the corona generating device. Transfer is effected by the corona generating device which imparts an electrostatic charge to attract the powder image from the drum to the support surface. The polarity of charge required to effect image transfer is dependent upon the visual form of the original copy relative to the reproduction and the electroscopic characteristics of the developing material employed to ef-

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fect development. As for example, where a positive reproduction is to be made of a positive original, it is usual to employ a developing material which is triboelectrically charged to negative polarity, and after formation of a powder image, positive polarity corona is used to effect transfer of the support surface. In contrast, to produce a positive reproduction from a negative original, it is usual to employ a positively charged developing material which is repelled by the non-image areas on the plate to the discharged image areas thereon and negative polarity corona is employed to effect transfer.

In the positive-to-positive type of reproduction described above the residual of developer is so tightly retained to the plate's photoconductive surface, by a phenomenon that is not fully understood but believed caused by an electrical charge, that it prevents transfer of the powder to the support surface particularly in the image areas, and it is therefore necessary to substantially neutralize this charge by means of a corona generating device before effecting removal of the powder residue by means of a cleaning apparatus.

Heretofore, typical plate cleaning means employed one or more rotating brushes which after substantial neutralization of charge referred to above, brushed residual powder from the plate and a withdrawing stream of air exhausted the removed powder through a filtering system. Whereas the brush method of powder removal produced satisfactory results, it has been discovered that equally good results are attained by apparatus constructed in accordance with the present invention and at far less cost of manufacture and operation.

A typical brush cleaning apparatus is disclosed in Walkup Patent 2,832,977. In Walkup, reference is made to the types of brush materials which have proven most satisfactory for plate cleaning. In general, and desirably, any cleaning material must be sufficiently soft so that it does not abrade the insulated plate surface and at the same time be sufficiently firm to remove the residual powder image without becoming matted or clogged after repeated use. Other factors, such as the triboelectric characteristics of the material also enter into the desirability of its selection and for brush cleaning in xerography animal furs such as New Zealand rabbit have shown themselves to be preferred. However, brushes of the animal fur type are expensive and at best have a limited cleaning life of approximately 35-40 hours when used, for example, to clean a 15½ inch diameter drum rotating at about 5 r.p.m. before they ultimately become clogged and operate at decreased efficiency. In addition, with brush cleaning it is necessary to employ a vacuum and filtering system in conjunction therewith for exhausting the removed powder. In the present invention, the need for a vacuum and filtering system are eliminated and instead of an expensive brush element, a web of low cost expendable fibrous material, as described below, is presented to the xerographic plate with a rubbing action to effect removal of the residual image.

In a known apparatus, removal of residual powder is effected by rubbing against the drum surface, to be cleaned, a web of fibrous material such as, for example, paper toweling, cheesecloth, flannel, and cotton fiber impregnated with a resin of urea formaldehyde. These inexpensive and disposable webs of fibrous material are advanced into pressure and rubbing contact with the xerographic plate and are gradually and continually advanced to present a clean surface to the plate whereby complete removal of residual powder from the plate is effected.

The principal object of the invention is to improve web cleaning apparatus for removing residual powder images from a xerographic plate.

Another object of the invention is to improve web cleaning apparatus for cleaning a xerographic plate in a manner to increase the efficiency of the cleaning operation and to decrease the manufacturing and operating costs of such apparatus.

For a better understanding of the invention as well as other objects and further features thereof, reference is had to the following detailed description of the invention to be read in connection with the accompanying drawings, wherein:

FIG. 1 illustrates schematically a xerographic reproducing apparatus employing a preferred embodiment of the web cleaner apparatus of the invention;

FIG. 2 is a left-hand view of a xerographic apparatus, illustrating the web cleaner of the invention in operative position in the apparatus;

FIG. 3 is a sectional view of the apparatus of FIG. 2 illustrating a drive mechanism for the web cleaner of the invention;

FIG. 4 is a side view of a preferred embodiment of the web cleaner apparatus of the invention;

FIG. 5 is a sectional view of the web cleaner apparatus taken along line 3-3 of FIG. 2;

FIG. 6 is a left-hand perspective view of the web cleaner apparatus removed from the machine; and,

FIG. 7 is a right-hand perspective view of the web cleaner apparatus with supply roll and take-up rolls removed from the assembly.

General

As shown, the xerographic apparatus comprises a xerographic plate including a photoconductive layer or light-receiving surface on a conductive backing and formed in the shape of a drum, generally designated by numeral 20, which is journaled in a frame to rotate in the direction indicated by the arrow to cause the drum surface sequentially to pass a plurality of xerographic processing stations.

For the purpose of the present disclosure, the several xerographic processing stations in the path of movement of the drum surface may be described functionally as follows:

A charging station, at which a uniform electrostatic charge is deposited on the photoconductive layer of the xerographic drum;

An exposure station, at which a light or radiation pattern of copy to be reproduced is projected onto the drum surface to dissipate the drum charge in the exposed areas thereof and thereby form a latent electrostatic image of the copy to be reproduced;

A developing station, at which a xerographic developing material including toner particles having an electrostatic charge opposite to that of the electrostatic latent image are cascaded over the drum surface, whereby the toner particles adhere to the electrostatic latent image to form a xerographic powder image in the configuration of the copy to be reproduced;

A transfer station, at which the xerographic powder image is electrostatically transferred from the drum surface to a transfer material or support surface; and

A drum cleaning and discharge station, at which the drum surface is first charged and then brushed to remove residual toner particles remaining thereon after image transfer, and at which the drum surface is exposed to a relatively bright light source to effect substantially complete discharge of any residual electrostatic charge remaining thereon.

The charging station is preferably located as indicated by reference character A in the schematic illustration of the apparatus. In general, the charging apparatus or corona charging device 21 includes a corona discharge array of one or more discharge electrodes that extend transversely across the drum surface and are energized from a high potential source and are substantially enclosed within a shielding member.

Next subsequent thereto in the path of motion of the xerographic drum is an exposure station B. This exposure station may be one of a number of types of mechanisms or members such as desirably an optical scanning or projection system or the like designed to project a line copy image onto the surface of the photoconductive xerographic drum from a suitable original.

The optical scanning or projection assembly consists of a copyboard in the shape of a drum, hereinafter referred to as copy drum 22, which is adapted to support copy to be reproduced and arranged to rotate in light-projection relation to the moving light-receiving surface of the xerographic plate. Uniform lighting is provided by suitable lamps attached to a slotted light reflector 23 mounted adjacent to the copy drum.

A light shield 24 adapted to protect the xerographic plate from extraneous light is positioned adjacent to the surface of the xerographic plate. A slot aperture 26 in the light shield extends transversely to the path of movement of the light-receiving surface of the xerographic drum 20 to permit reflected rays from the copy drum to be directed against a limited transverse area of the light-receiving surface as it passes therebeneath.

To enable the optical system to be enclosed within a relatively small cabinet, a folded optical system including an object mirror 26, a lens 27, and an image mirror 28 is used in the preferred embodiment of the apparatus.

Copy fed through paper guides 31 to the copy drum is removably secured thereon by a suitable gripper mechanism for movement therewith in timed relation to the movement of the xerographic drum whereby a flowing image of the copy is projected onto the xerographic drum. The copy is held against the surface of the copy drum by means of guides 32 and 33, the latter also preventing the trailing edge of the copy from contacting the web cleaner 54. After the copy is scanned it can be released from the copy drum to be transported out of the machine by copy feed out roller 34 coacting with the peripheral surface of the copy drum to forward the copy through copy guide 30.

Adjacent to the exposure station is a developing station C in which there is positioned a developer apparatus 35 including a developer housing having a lower or sump portion for accumulating developer material 36. Mounted within the developer housing is a motor driven bucket-type conveyor used to carry the developer material previously supplied to the developer housing to the upper portion of the developer housing from where the developer material is cascaded over a hopper chute onto the drum.

As the developer material cascades over the drum, toner particles of the developer material adhere electrostatically to the previously formed electrostatic latent image areas on the drum to form a visible xerographic powder image; the remaining developer material falling off the peripheral surface of the drum into the bottom of the developer housing. Toner particles consumed during the developing operation to form the xerographic powder images are replenished by a toner dispenser 37, of the type disclosed in copending application Serial No. 77,955, filed concurrently herewith on December 23, 1960, in the names of Roger H. Eichorn and William G. Lewis, mounted within the developer housing.

Positioned next adjacent to the developing station is the image transfer station D which includes suitable sheet feeding mechanism adapted to feed sheets of paper successively to the xerographic drum in coordination with the presentation of the developed image on the drum at the transfer station. The sheet feeding mechanism includes a sheet source such as tray 41 for a plurality of sheets of a suitable support material, that is, sheets of paper or the like, a separator roller 42 adapted to feed the top sheet of the stack of support material to a sheet conveyor mechanism 43 having paper grippers 44 thereon which carry the sheet support material into contact with

the rotating xerographic drum in coordination with the appearance of a developed image at the transfer station.

The transfer of the xerographic powder image from the drum surface to the support material is effected by means of a corona transfer device 45 that is located at or immediately after the point of contact between the support material and the rotating xerographic drum. The corona transfer device 45 is substantially similar to the corona discharge device that is employed at the charging station in that it also includes an array of one or more corona discharge electrodes that are energized from a suitable high potential source and extend transversely across the drum surface and are substantially enclosed with a shielding member. In operation, the electrostatic field created by the corona transfer device is effective to tack the transfer material electrostatically to the drum surface and simultaneously with the tacking action, the electrostatic field is effective to attract the toner particles comprising the xerographic powder image from the drum surface and cause them to adhere electrostatically to the surface of the support material.

As the paper gripper mechanism continues to move forward in its closed circuit, it will strip the support material from the xerographic drum and carry it to a fixing device, such as, for example, heat fuser 46, whereat the developed and transferred xerographic powder image on the support material is permanently fixed thereto.

After fusing, the finished copy is preferably discharged from the apparatus at a suitable point for collection externally of the apparatus. To accomplish this there is provided a pair of delivery rolls 47 and 48 by means of which the copy is delivered to a copy holder after it is released by the gripper mechanism. Suitable cam means are provided at the receiving and delivery stations of the conveyor mechanism to actuate the paper gripper at these stations to receive or discharge a sheet of support material.

The next and final station in the device is a drum cleaning station E whereat any powder remaining on the xerographic drum after the transfer step is removed and whereat the xerographic drum is flooded with light to cause dissipation of any residual electrical charge remaining on the xerographic drum.

To aid in the removal of any residual powder remaining on the xerographic drum there is provided a corona precleaning device 51 that is substantially similar to the corona discharge device that is employed at charging station A. Removal of residual powder from the xerographic drum is effected by means of a web cleaner device 54 adapted to continuously feed a clean fibrous web material into wiping contact with the xerographic drum. As shown, the web material 55 is taken from a supply roll 56 and transported around a cleaning roll 57, preferably made of rubber, around a guide plate 58 to be wound on a take-up or rewind roll 61.

Any residual electrical charge remaining on the xerographic drum is dissipated by light from a fluorescent lamp 62 mounted in a suitable bracket above the xerographic drum, a suitable starter being provided for energizing the fluorescent lamp.

Suitable drive means drive the xerographic drum, the copy drum, and the sheet conveyor mechanism at predetermined speeds relative to each other, and to effect operation of the paper separator roll, and the web cleaner mechanism, the latter being driven at a speed whereby relative movement between the xerographic drum and the web material is effected. Suitable drive means are also provided for effecting operation of the conveyor mechanism and toner dispenser of the developing apparatus assembly.

It is believed that the foregoing description is sufficient for the purposes of this application to show the general operation of a xerographic reproducing apparatus. For further details concerning the specific construction of the xerographic apparatus shown, reference

is made to copending application, Serial No. 77,954, filed concurrently herewith on December 23, 1960, in the name of Roger H. Eichorn and William G. Lewis.

Plate clearing assembly

To remove any residual powder that may remain on the xerographic plate after the transfer process, there is provided a plate cleaning assembly, and to dissipate any residual electric charge remaining on the plate a light source is used to flood the portions of the xerographic plate with light as it passes through the cleaning station.

The plate cleaning assembly used to clean residual powder from the xerographic plate is of the type in which a web of clean inexpensive fibrous material is advanced into contact with the plate to continuously present a fresh cleaning area of the web to the plate for removing residual powder therefrom. Appropriately, this type of plate cleaning apparatus is referred to as a web cleaner.

Referring now to the subject matter of the invention, there is shown in FIGS. 2 to 5, inclusive, a preferred embodiment of a web cleaner apparatus constructed in accordance with the invention.

As shown, the web cleaner 54 includes a right-hand side plate 401 and a left-hand side plate 402 held in rigid spaced-apart parallel relationship by means of a spacer or guide plate 58 which also acts as a guide for the web as described hereinafter. A web of material such as 55, used to clean the drum, carried preferably by a cardboard cylinder 403 on supply roll 56, is fed around cleaner or pressure roll 57 into contact with the drum and then the web of material, dirty side up, travels over the backside of the spacer to a second cardboard cylinder 403 mounted on a driven take-up or rewind roll 61.

The cleaner or pressure roll 57, preferably made of rubber, is bonded to shaft SH-16, journaled by bearings 411 mounted in the side plates, and driven by gear 404 fixedly attached by pin 405 to the shaft outboard of the right-hand side plate, suitable washers 406 and 407 centering the cleaner roll with respect to the side plates.

The supply roll 56 and the take-up roll 61 formed as hollow cylinders for the purpose described hereinafter, are removably journaled in bearings 408 and 409, respectively, mounted on the side plates as shown.

Both side plates have slots 412 formed therein over which the bearings 408 and 409 are centered. The portions of the bearings 408 in which the ends of the paper supply roll are journaled have slots 413 formed therein, while the bearings 409 have slots 414 formed therein extending the full length of the bearing, the aforementioned slots in the bearings corresponding in shape to the slots 412 formed in the side plates so that the supply and take-up roll may be removed from the web cleaner for the removal and/or replacement of the web material thereon.

Right-hand roll lock 415 and left-hand roll lock 416 are slidably mounted on the right-hand side plate and the left-hand side plate, 401 and 402, respectively, by means of pivot studs 417 secured to the side plates. The roll locks are biased into frictional contact with their respective side plates by means of springs 418 secured to the pivot studs. The roll locks are formed with depending lock portions 419 that engage the rolls when in their lowered position to lock the rolls in their respective bearings.

Both the supply roll and the take-up roll are each provided with a pin 438 adapted to engage the cardboard cylinders bearing the web material whereby the cardboard cylinders will rotate with the respective rolls upon which they are mounted.

A dowel 421 is secured to the plates 11 and 12 so that it extends outward from the plate 11 toward plate 10 but terminating just short of the latter plate to support the web cleaner in the xerographic apparatus while still permitting it to be removed therefrom, and to guide

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the web cleaner as it is removed from the xerographic apparatus or inserted into the xerographic apparatus. The dowel 421 is adapted to slidably and pivotally receive bearing 408 on the right-hand side plate, the dowel extending into the paper supply roll 56 but out of contact therewith when the web cleaner is positioned to abut the spacer 422 secured by retaining ring 423 on the dowel adjacent to plate 11.

The web cleaner when mounted on the dowel, as described, is free to be rotated about the dowel so that the cleaner roll 57 can be biased into operative position against the peripheral surface of the xerographic drum with a web material sandwiched therebetween, or it can be rotated so that the cleaner roll is moved away from the peripheral surface of the drum so that during removal it will not scratch the drum surface.

The cleaner roll of the web cleaner is cammed into operative position by means of a cam 424 coacting with the cam plate 420 secured to the left-hand side plate. The cam 424 is secured to axle 425 rotatably mounted in the left-hand side plate 10 and the axle is provided with a square end extending from the plate to receive a conventional wrench or other tool for manipulation by an operator. To rotate the web cleaner out of operative position a handle 426 is secured to the left-hand side plate for manual manipulation by an operator.

When the web cleaner is cammed into operative position the gear 404 on shaft SH-16 is driven by gear 427 on the drum drive shaft SH-1 through a gear train consisting of gears 428 and 429 rotatably mounted on shaft SH-13, gears 431 and 432 rotatably mounted on shaft SH-14, and gears 433 and 434 rotatably mounted on shaft SH-15, each of the aforementioned shafts being mounted on plate 11.

A rewind shaft 435 slidably mounted within the rewind rollers by means of outboard bushing 436 and inboard bushing 437 secured in the ends of the rewind roller, is coupled by means of the pin 438 to the rewind roller for rotation therewith, the pin extending through an elongated opening 439 in the rewind shaft to permit relative axial movement of the rewind shaft with respect to the rewind roller. The rewind shaft has a bifurcated end adapted to engage a drive pin 441 secured in the hollow end of shaft SH-17. Shaft SH-17, journaled in plates 11 and 12, is driven by belt 442 connecting it to pulley 443 secured between gears 433 and 434 on shaft SH-15, tension on the belt being maintained by idler 444 rotatably mounted on shaft SH-18 and biased against the belt by spring 456 connected at one end to the idler and at its other end to stud 457 in plate 11.

The rewind shaft is normally biased into driven engagement with the pin on shaft SH-17 by means of spring 445 encircling the rewind shaft between the outboard bushing 436 and the spring stop 446 secured thereon by dowel pin 447. To permit rotation of the web cleaner away from the drum so that it can be removed from the xerographic apparatus, such as through a suitable opening in the frame plate 19 as seen in FIG. 2, the rewind shaft can be pulled out, that is, to the left, as seen in FIG. 5, so that it clears the end of shaft SH-17. The rewind shaft is maintained in this inoperative position against the biasing force of spring 445 by latch 448 adapted to engage the undercut portion of the rewind shaft. The latch is pivotally secured to the left-hand side plate by means of a latch stud 451.

The pressure roll 57 is preferably driven at a rotational speed with respect to the speed of rotation of the xerographic drum to affect a relative web speed in the order of one-thirtieth to one-seventieth of the plate speed. The actual relative web speed used, depends on the relative amount of toner that must be cleaned from the drum, the pressure at which the web is forced against the surface of the drum. From the economic standpoint, it is desirable to present the minimum amount of clean web material to affect complete cleaning of the drum surface.

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Thus in actual practice it has been found, that with a relative web speed of one-fiftieth of the plate speed, at a uniform pressure in the order of 1½ to 3 pounds per lineal inch across the drum surface as applied by the pressure roll 57, sufficient clean web material is presented to the drum surface to affect complete cleaning of the drum surface and at the same time excess clean web material is not needlessly consumed.

It is apparent that the web cleaning apparatus of the invention, as described, is readily removable by an operator from the xerographic apparatus to permit either servicing of the xerographic drum or the web cleaning apparatus. By permitting removal of the web cleaning apparatus from the xerographic machine the supply and take-up rollers of the unit are accessible to an operator to permit him to remove the used web of cleaning material and to replenish it with a new supply of web material without undue shut-down time of the xerographic apparatus.

While the invention has been described with reference to the structure disclosed herein, it is not confined to the details set forth since it is apparent that various modifications can be made to the web cleaner, such as for example, a pressure pad or other device can be used to force the web of fibrous material into cleaning contact with the surface of the xerographic plate. This application is therefore intended to cover such modifications or changes as may come within the purposes of the improvements or the scope of the following claims.

What is claimed is:

1. In a xerographic reproducing apparatus wherein a xerographic plate in the form of a drum is journaled in a frame element of the machine to be driven by a suitable drive means through a series of xerographic processing stations including a plate cleaning station wherein residual powder remaining on the drum is removed; the improvement including a frame having two spaced parallel side plates, a pressure roll journaled for rotation in said side plates, a supply roll and a take-up roll journaled in said side plates, said supply roll and said take-up roll being positioned with their axes parallel to the axis of said pressure roll whereby a web of cleaner material can be fed from said supply roll around said pressure roll to be rewound on said take-up roll, a first driven means connected to said pressure roll, a second driven means connected to said take-up roll, a locating dowel secured to said frame element, a first drive means and a second drive means connected to said frame element, and cam means connected to said frame element, said locating dowel being positioned to slidably and pivotally receive said supply roll and said cam means being positioned to abut against said frame to pivot said frame about said locating dowel to force said pressure roll against said xerographic plate with a web of cleaning material sandwiched therebetween and to connect said first driven means to said first drive means and to connect said second driven means to said second drive means.

2. In a xerographic reproducing apparatus wherein a xerographic plate in the form of a drum is journaled in a frame element of the machine to be driven by a suitable drive means through a series of xerographic processing stations including a plate cleaning station wherein residual powder remaining on the drum is removed; the improvement comprising a web cleaner apparatus including a frame having two spaced parallel side plates, a pressure roll, a hollow cylindrical supply roll, and a hollow cylindrical take-up roll journaled in said side plates, said supply roll and said take-up roll being positioned with their axes parallel to the axis of said cleaning roll whereby a web of cleaner material may be fed from said supply roll around said pressure roll to be rewound on said take-up roll, a first driven means connected to said pressure roll, a second driven means connected to said take-up roll; a locating dowel secured to said frame element, a first drive means and a second

drive means connected to said frame element, and cam means connected to said frame element, said locating dowel being positioned to slidably and pivotably receive said hollow cylindrical supply roll and said cam means being positioned to abut against said web cleaner to pivot said web cleaner about said guide pin to force said pressure roll against said xerographic plate with a web of cleaning material sandwiched therebetween and to connect said first driven means to said first drive means and to connect said second driven means to said second drive means.

3. In a xerographic reproducing apparatus wherein a xerographic plate in the form of a drum is journaled in a frame element of the machine to be driven by a suitable drive means through a series of xerographic processing stations including

- a plate cleaning station wherein residual powder remaining on the drum is removed;
- the improvement including
- a frame having spaced parallel side plates,
- a pressure roll journaled for rotation in said side plates,
- a supply roll and a hollow take-up roll journaled in said side plates, said supply roll and said take-up roll being positioned with their axes parallel to the axis of said pressure roll whereby a web of cleaner material can be fed from said supply roll around said pressure roll to be rewound on said take-up roll,
- a first driven means connected to said pressure roll,
- a second driven means slidably positioned in said hollow take-up roll and operatively connected to said take-up roll,
- a locating dowel secured to said frame element,
- a first drive means and a second drive means connected to said frame element,
- and cam means connected to said frame element,
- said locating dowel being positioned to slidably and pivotably receive said frame,
- said cam means being positioned to abut against said frame to pivot said frame about said locating dowel to force said pressure roll against said xerographic plate with a web of cleaning material sandwiched therebetween and to connect said first driven means to said first drive means to advance web material in wiping contact with the drum and to align said second driven means with said second drive means

whereby said second drive means engages said second driven means to rotate said take-up roll to rewind web material thereon.

4. In a xerographic reproducing apparatus wherein a xerographic plate in the form of a drum is journaled in a frame element of the machine to be driven by a suitable drive means through a series of xerographic processing stations including

- a plate cleaning station wherein residual powder remaining on the drum is removed;
- the improvement comprising
- a web cleaner apparatus including a frame having spaced parallel side plates,
- a pressure roll,
- a cylindrical supply roll,
- and a hollow cylindrical take-up roll journaled in said side plates,
- said supply roll and said take-up roll being positioned with their axes parallel to the axis of said cleaning roll whereby a web of cleaner material may be fed from said supply roll around said pressure roll to be rewound on said take-up roll,
- a driven means connected to said take-up roll;
- a locating dowel secured to said frame element,
- and cam means connected to said frame element,
- said locating dowel being positioned to slidably and pivotably receive said hollow cylindrical supply roll,
- said cam means being positioned to abut against said web cleaner to pivot said web cleaner about said guide pin to force said pressure roll against said xerographic plate with a web of cleaning material sandwiched therebetween and to connect said driven means to said drive means to effect movement of web material onto said take-up roll.

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NORTON ANSHER, *Primary Examiner*.

JOHN M. HORAN, EMIL G. ANDERSON, *Examiners*.