

[54] **ELECTROSTATIC COPIER**

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[51] Int. Cl. **G03g 13/00**

[58] Field of Search **96/1, 1.4; 355/10, 17**

[56] **References Cited**

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Primary Examiner—Richard M. Sheer

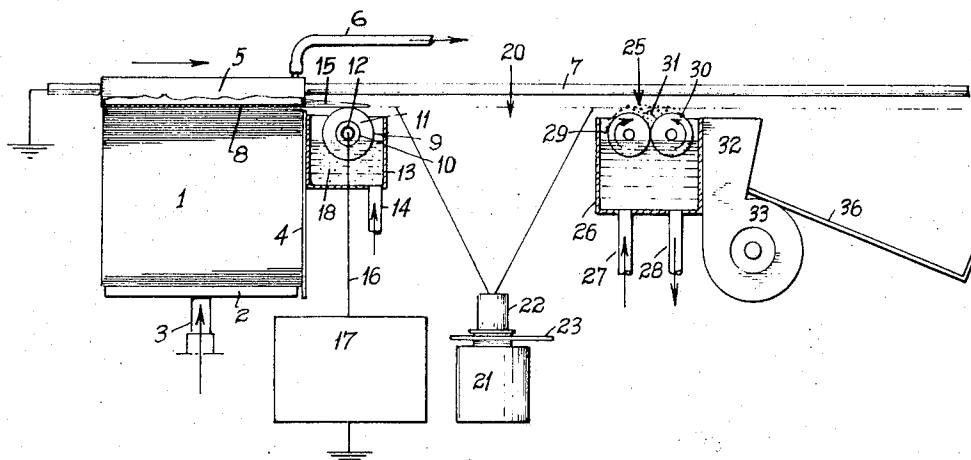
Attorney, Agent, or Firm—Vern L. Oldham et al.

[57]

ABSTRACT

A method of producing electrostatic images in a machine using pre-cut or continuous paper, in which a coloured photoconductive medium is applied to the surface of the sheet and charged and then exposed to electro-magnetic waves to produce a latent image on the photoconductor film by discharging the photoconductor in non-image areas and selectively removing the photoconductor film from the non-image areas to leave a visible image on plain paper in the image areas only.

9 Claims, 3 Drawing Figures



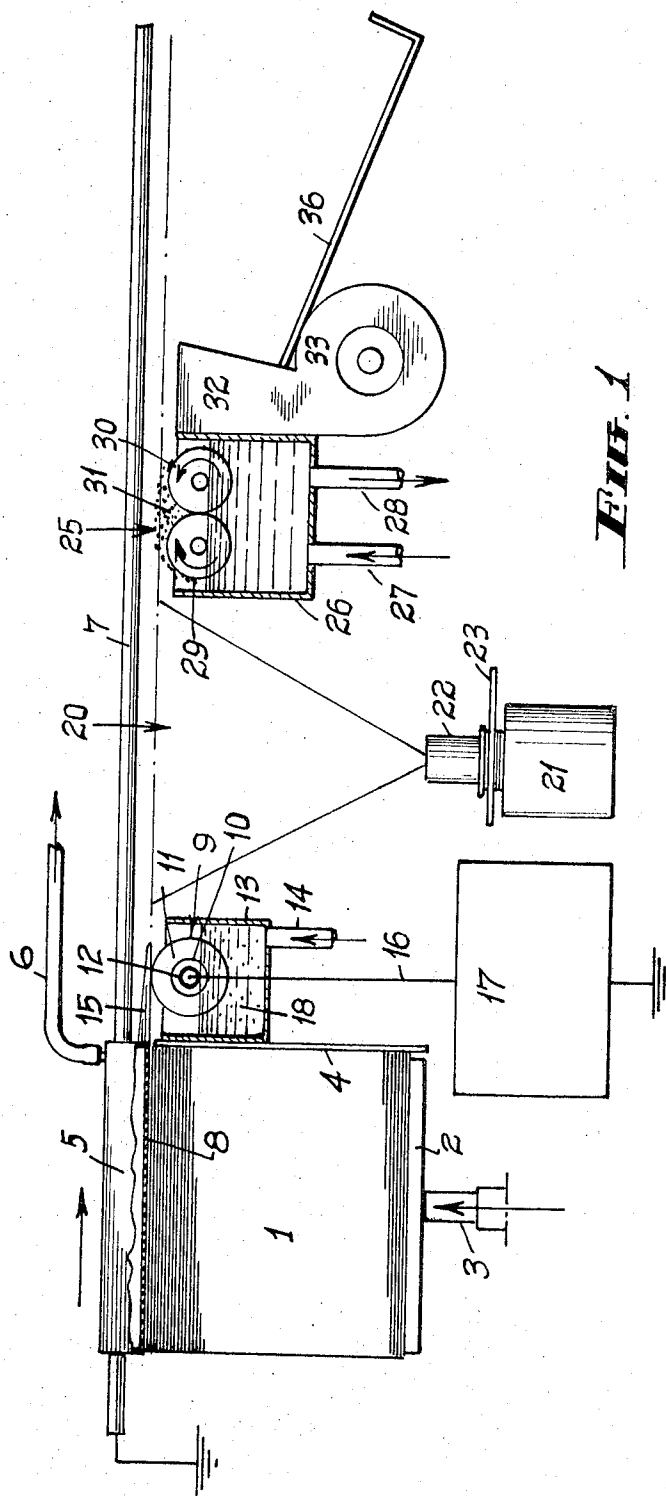
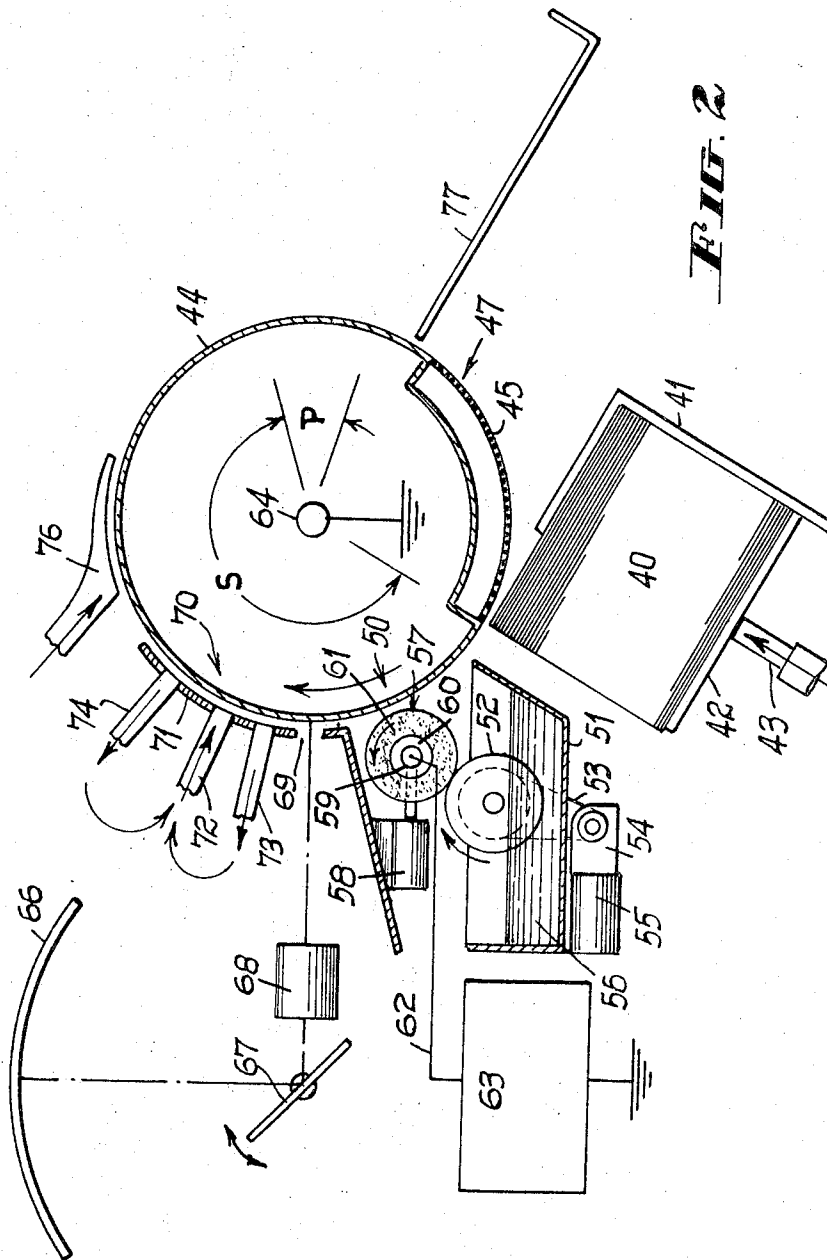


FIG. 1



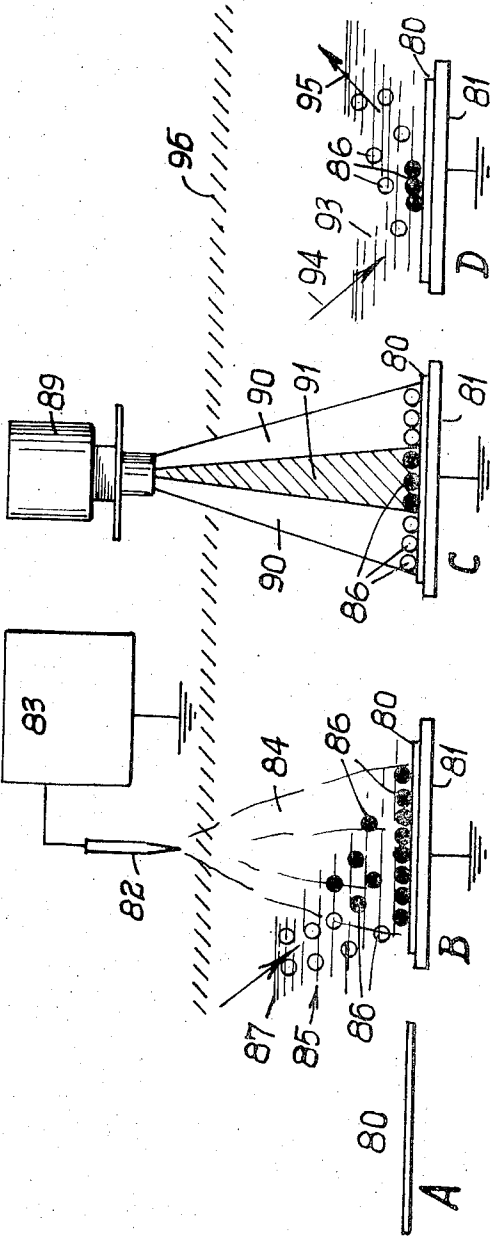


FIG. 3

ELECTROSTATIC COPIER

BACKGROUND OF INVENTION

This invention relates to an electrostatic copier and in particular it relates to a method of and means for affecting electrostatic copying of images on uncoated paper.

Electrostatic copying usually comprises the copying of the subject matter on a photoconductive membrane which then forms the copy material, or which may be used to transfer the image to uncoated paper.

Throughout this specification "uncoated paper" is taken to mean paper which does not contain a photoconductive film or penetration.

Perhaps the best known method of affecting electrostatic copying is that in which a drum having a selenium face receives an image which is then developed on the drum by subjecting the latent image on the selenium surface to a developing powder, which powder image is then transferred to paper and is fused to the paper by the application of sufficient heat, the developer for this purpose including a resin which is readily fusible to bond the image in position on the paper.

Other machines and methods for affecting the electrostatic copying use what is known as a wet developer system in which the developer or marking powder is carried in a liquid and is deposited out of the liquid onto a photoconductive medium on which a latent image has been formed by charging such medium and then light bleeding same to produce a latent image. According to such a method it is common to coat the paper which is to form the image containing medium with a thin film of a photoconductor embodied in a layer of insulating medium such as a resin which remains permanently on the paper.

It is well known that while dry powders can be transferred fairly readily without any problems, the same is not true when using liquid developers because of the tendency of the developer to fix on evaporation of the carrier liquid, and thus with liquid developer transfer must be quickly effected before the developer dries.

As it is generally conceded that the methods of liquid development have very substantial advantages over methods using a dry powder, largely due to the finer suspension which is obtainable and also to the better control of the deposition of the developer medium from a liquid, modern practice utilizes photoconductive coated paper or surfaces to achieve the best possible results, but this brings about the problem that whereas in the dry system it is easy to provide the final copy on bank paper or the like, this is not so with the wet developer processes because of the retention on the paper backing or similar medium of the photoconductor coating.

Not only does this add weight to the final paper or other copy, but it has the disadvantage of not being similar to ordinary printing where the image is deposited directly onto the paper or backing, a feature which is highly desirable.

It is therefore an object of this invention to provide a method and machine in which the image is produced on a photoconductor film but the film is removed in at least non-image areas.

SUMMARY OF INVENTION

The object of the present invention is achieved by treating the paper or other backing with a coloured

photoconductive medium just prior to the image producing step and then producing the image on the surface by removing the photoconductive in at least non-image areas.

There are at the present time various machines in use, using the wet developer method, which feed from a continuous roll of paper, or a stack of paper, and which pass this paper as required through a charging zone, then through an image forming zone, and then through a developer zone, and after drying the image so produced, the sheet is discharged from the machine. In such machines a permanent coating of photoconductive medium exists on the sheet, but this invention may be applied by simply adding to a machine of this kind, a coating step which can take place just prior to the charging station and such a machine can then be fed with ordinary blank paper or the like and the copies issuing from the machine will be produced on this paper because the intermediate step of applying an over-all photoconductor and then removing it excepting perhaps in image areas will leave the paper in its original condition excepting for the production of an image thereon.

Instead of simply using an uncoated paper for similar medium, it will be realised that the paper or the like could be coated with a polystyrene or polyvinyl or similar base which could be in the nature of a very thin film giving the surface of the paper a better texture or impregnated into the surface of the film as a very thin layer so that while the paper still appears to be ordinary blank paper it has a coating on it of a high resistivity medium which forms a better base for the reception of the photoconductor medium by providing a more uniform surface and yet acts as a release agent whereby the film can be more readily removed where required.

The application of the photoconductive medium to the paper can be by dipping, brushing, or by electrocoating or it can be sprayed onto the surface, but in any case the object of the invention is to ensure that there will be a thin coloured film of photoconductor on the surface of the paper or other backing which after exposure and development will be readily removable at required areas without removing the deposited image. Preferably the colour medium reacts with the photoconductor to colour the photoconductor which is fixed at the image localities but removed at those areas where no image exists. That is, the colouring medium combines with the photoconductor to form the image, and as dye sensitised photoconductors are known to be more suitable for good results, such as by increasing speeds, these can be used because the colour is retained only in the image areas and does not discolour the background.

In order, however, that the nature of the invention may be fully appreciated some embodiments thereof will now be described but it is to be clear that the invention need not necessarily be limited to these.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 shows somewhat schematically in side elevation a system in which a stack of sheets of paper are fed forward through a coating applicator station, the coating being then modified by the projection thereon to of an image, after which the coating is removed where not held by the latent image, the sheet containing the image

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in the form of deposited coating particules being then dried and the paper discharged to a receiving tray.

FIG. 2 shows a similar type of application but utilizing a rotary drum feed, but again involving a stack of papers which are fed through a coating applicator stage and then imaged electrostatically, after which the excess coating which is not forming the image is removed from the surface and the sheet is then dried and fed to a receiving tray.

In FIG. 3 is shown diagrammatically the general basis of the invention where (a) indicates an uncoated sheet about to be processed, this being a plain sheet of paper, (b) shows how the coating is applied to the paper and simultaneously charged by a corona producing device, (c) shows how the image is then light-modified to discharge part of the coating material, and (d) shows how the wash then removes the discharged coating material to leave only the image on the paper.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring first to FIG. 1, a stack of papers is carried on a platform 2 which is adapted to be fed upwardly by a lifting mechanism 3, such as a hydraulic mechanism. The stack of papers is guided by the frame 4.

Immediately above the papers is shown a vacuum platen 5 which is connected through a line 6 to a suitable vacuum source. This is regulated so that when the vacuum platen 5 which moves on the guide 7 is energized, the perforate surface 8 of the vacuum platen engages the upper sheet of paper from the stack 1 and the platen is then moved in the direction of the arrow to cause the paper to traverse the applicator roller 9 which comprises a metallic core 10 and a semiconductor covering 11. The covering 11 is rubber or the like which allows a corona to be effective at the contact point with the paper on the platen.

The applicator roller is supported on a shaft 12 and rotates freely within a tank 13 to which coating material is fed through the line 14, this coating material comprising a particulate photoconductive substance in an insulating medium, the photoconductive substance being tinted such as by including or having on it a resin coating which is adapted to hold a charge on its surface in that it is an insulator, but is slightly soluble in the carrier liquid so that the surface of the particles is in a condition where when the surface to which it has been applied is thoroughly dried, the tackiness of the medium will cause permanent adhering to the surface.

A prong 15 projecting forwardly from the vacuum platen 5 contacts the applicator roller and rotates it so that its surface, which dips into the coating material is already wetted when the paper sheet reaches it so that there is a coating of the entire surface of the paper sheet with the photoconductive coating material.

The shaft 12 of the applicator roller 9 is connected by a lead 16 to a high voltage generator 17 which, as shown, is earthed, the guide 7 being similarly earthed so that there is a corona field generated between the applicator roller and the vacuum platen which not only assists application of the coating material to the paper, but at the same time charges the photoconductor in that the voltage applied to the shaft 12 is sufficiently high, acting through the core 10 and a semiconductor covering 11 to give an effect similar to that obtained when a photoconductive surface is subjected to a displaced point corona discharge.

The coating medium is designated 18.

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The vacuum platen 5 passes on until it is at the imaging station 20, where an image is projected on to the paper by a projector 21 having a lens 22 and a transparency or the like 23, this then producing a light image on the photoconductive surface on the paper.

Immediately such a surface has been light modified, so that part of the photoconductive surface is now in a charged condition while other parts of it are in a discharge condition, the charged particles will tend to adhere firmly to the paper by the electrostatic field, whereas the discharge particles will be only loosely held thereon due to surface tension of the film of liquid which forms part of the applied film.

The vacuum platen 5 is now moved on to pass the paper over the washing station 25 which comprises a tank 26 having a supply of washing fluid, which may be similar to the carrier liquid, applied to it through the line 27 and removed through the line 28 so that there is a renewal of this liquid, or the liquid may be passed through filter or the like (not shown) by means of a pump, (also not shown) to maintain the required purity of the liquid. This liquid may be chosen to soften the developer particles for fixing purposes when the liquid is removed.

Within the tank 26 are a pair of rollers 29 and 30 which are driven in opposite directions by a motor or the like so that they carry liquid upwards on their outer peripheries to form a pool 31 of agitated liquid which is projected into the path of the paper being carried across this washing locality by the vacuum platen 5, and the action of this is to remove any of the coating particles which are not rigidly held by the latent electrostatic field, which is still present at this stage, so that only the particles held by the field will remain in position on the surface of the paper sheet but the remaining coating will be removed and the final product will then be a plain sheet of paper similar to that which was fed into the machine from the paper stack excepting that an image is now produced on it by the electrical adhesion at this stage of the coloured coating particles.

As the platen 5 moves forward over a drying station 32, which can be supplied with a blast of heated or cold air supplied by a fan 33, any carrier liquid remaining, and washing fluid, is evaporated, thus causing the image to be firmly fixed to the paper surface due to the resin which is present and which hardens as the liquid is evaporated.

The platen 5 then moves on to the discharge locality 35 where the vacuum is terminated and if necessary a slight positive pressure applied to eject the sheet on to the tray 36.

The platen 5 then returns to its starting locality, and when a further copy is to be made, the vacuum is again applied and after engaging a paper the platen moves forwardly through the various stations to produce another copy.

Referring now to FIG. 2 where a rotary drum type of machine is shown, a paper stack 40, is guided by a frame 41 and rests on a lifting platform 42, which is urged upwardly by a hydraulic mechanism 43 or any other suitable loading such as spring loading.

Situated immediately above the stack 40 is a drum 44 which has a plain periphery excepting at a paper pick-up location where it has a perforate portion 45 behind which is a cavity defined by a wall 46 to form a vacuum platen 47. When suction is applied to the cavity the perforate portion 45 draws paper towards it and holds

the sheet firmly on the perforate portion so long as the suction is applied, this being defined approximately by the line (s), after which the suction is the platten is released and a positive pressure (p) applied over the arc indicated in the illustration, the points marked corresponding in each case to the leading edge of the platten 47.

The action of the platen 47 is to draw the top sheet of the paper from the stack 40 against the perforate portion 45 and hold it there so that as the drum rotates in the direction of the arrow, a sheet of paper will be drawn out from stack 40 and will be firmly held on the platen 47 by the suction applied thereby.

Adjacent the paper stack 40 is the coating station 50 which comprises a tank 51 having within it a roller 52 driven by a belt 53 from the gear box 54 of a motor 55, the tank 51 containing in it the coating medium 56.

The roller 52 is constantly driven in the direction of the arrow and that serves to keep coating medium agitated and also to keep the surface of the coating roller 52 wet with the coating liquid. Normally in contact with this coating roller 52 is an applicator roller 57 which has its surface wetted with the coating liquid 56, but the applicator roller 57 is under control of the solenoid 58 so that it can be pushed forwardly at an appropriate time to contact a sheet of paper from the stack 40 as it reaches this locality and thus apply coating material to the surface of the paper.

The applicator roller 57 comprises a shaft 59 surrounded by a metal core 60 and this in turn is surrounded by a semi-conducted medium 61 which serves as the corona type charging mechanism for the device, the shaft 59 being coupled by a lead 62 to a high voltage generator 63 which is earthed as shown. The action is similar to that described with reference to the applicator roller 9 of FIG. 1.

The shaft 64 of the roller 52 is also earthed, so that when a voltage is applied to the applicator roller 57, a field is produced between the roller 57 and the drum 44 and this again has the effect of charging the coating material as it is applied so that a uniform coating of a charged photoconducted medium is formed on the sheet of paper carried through the coating station by the platen.

When the applicator roller 57 is projected forward into contact with the paper it loses contact with the roller 52 and is then driven by contact with the paper, but as coating material is carried upwardly by the roller 52 into the gap between the two rollers a constant supply of coating material is given to the applicator roller 57 which is applied to the paper, any excess if such is present flowing back into the tank 51.

The latent electrostatic image is in this case produced from an original placed on to the curved transparent rest 66, and is scanned by a mirror 67, which moves at a rate such that scanning of the original takes place in proportion to the rotational speed of the drum 44, a lens 68 projecting the image from the mirror through a slit 69 on to the paper as it passes through this station.

In this way, the surface of the paper has a latent electrostatic image produced on it as it passes the slit 69, but immediately it leaves this area it reaches the washing station 70 which comprises a wall 71 which may be an electrode, this wall being provided with three ducts 72, 73, and 74, the duct 72 being a central duct, and the like the ducts 73 and 74 extends across the com-

plete width of the drum, the central duct 72 being a supply duct for the washing fluid while the ducts 73 and 74 on either side of it are suction ducts which remove the fluid, the three ducts leading away to a mechanism which is not shown but which simply comprises a pump and means to apply a relatively strong suction to the ducts 73 and 74 so that cleaning liquid can be fed into the duct 72 and will pass in either direction from its outlet into the gap between the wall 71 and the paper on the drum 44 so that there is a turbulent washing area in this location, the liquid used to supply the duct 72 and which is removed through the ducts 73 and 74 being cleaned or purified as required during circulation and if desired the recovered developer particles can be fed back to the coating medium.

Thus there is again a washing of the surface which contains a latent electrostatic image and again the surface is cleansed of any particles of coating material which are not firmly held in position by the latent electrostatic image so that again a sheet of paper emerges from this zone which bears only the image and has any coating material removed from the non-image areas.

From the washing locality the paper enters a drying station 76 and after leaving this is discharged from the platten by termination of the suction and by the application of positive pressure if required, to be received on the tray 77.

The drum can continue to rotate until a required number of copies has been produced because each time it reaches a position shown in FIG. 2 and the suction is applied, a sheet of paper will be picked up by the platen and will be moved first through the coating station then through the exposure station and then through the washing and drying stations to produce the final copy.

In FIG. 3 is shown somewhat schematically now the process operates.

At (a) is shown a sheet of uncoated material such as paper, this being designated 80.

At (b) is shown how the sheet 80 is placed on to a base 81 which is earthed and forms a base electrode.

82 represents a corona discharge point and this is connected to a high voltage generator 83 which as shown is earthed.

Excitation of the generator 83 causes a corona to be produced between the discharge point 83 and the base electrode 81, the corona being indicated by 84. In the forms described in FIGS. 1 and 2 the corona effect is produced in or on the surface of the semi-conductor adjacent the platen.

85 represents a flow of coating material into the corona zone, this comprising photoconducted particles 86 carried in a carrier liquid 87, this preferably being a liquid having a relatively high insulating value, the photoconductor particles preferably being coating with a colouring medium corresponding to the colour of the final reproduction required, which colouring medium can be a resin slightly soluble in the carrier liquid, but more preferably in the washing fluid, so that when subsequently the liquid is dried off, any particles adhering to the sheet 80 will be bonded thereto.

At (b) is shown how uncharged particles are deposited on the sheet 80 in the corona zone, where they become charged and evenly distributed and held down on the sheet 80 because of the presence of the base electrode 81.

At (c) is shown how a projector 89 can produce a latent image, the white zones 90 representing a light image, the shaded zone 91 indicating dark areas.

It will be noted that the photoconductive particle 86 on the sheet 80 are now discharged in the light areas but remain charged in the dark areas so that there is a difference between the state of the particles in accordance with the amount of light striking them.

It is obvious then that particles which contain a substantial charge will be held firmly in position while particles where the charge has been removed will be free to leave the sheet 80 when the surface tension hold is broken, and this is demonstrated in (d) where the washing liquid 93 sweeps the surface as defined for instance in the two embodiments described earlier as FIGS. 1 and 2, and it will be noted that the washing liquid which enters in the direction of the arrow 94, leaves in the direction of the arrow 95, carrying with it the photoconductive particles which have been discharged and, therefore, do not have a firm attachment to the paper because they no longer have a strong field attraction, whereas the particles which have retained the charge have remained in position on the sheet 80 and, therefore, immediately the washing is completed and the sheet 80 is removed and allowed to dry, the particles which adhered are fixed due to solvent action on the surface of the particles are previously mentioned, or they could be heat fixed or fixed in any other way.

The whole of the process of course must be carried out in the dark to maintain the image differential charge and the shaded line 96 represents that the stages illustrated must be carried out in the dark so that the only discharging which can take place is at the time of exposure to produce the latent image.

It is preferred to carry the removed photoconductor medium away by washing rather than to use a bias plate to lift it from the surface, because in this way the removal area is kept clean in that the removed particles are carried away and can readily be recovered at a remote area with saving of material and maintaining of clean washing fluid.

In FIG. 3 the drying step has not been shown but this can be carried out in any convenient manner.

Throughout the sections of FIG. 3 the particles which retained the charge given them by the corona as they are deposited, are shown as solid black particles but particles which have been discharged by light are shown as circles with any fill in.

Examples of the coating material and washing fluid will now be described.

The expression "Insulating" is generally used to include substances having an electrical resistivity in excess of 10^9 Ohm centimetres, and the colouring medium if it is embodied in the insulator and is not formed by the photoconductor, should not reduce the insulating value of the particle coating to any marked extent.

EXAMPLE 1

A black coating is formed on a sheet by applying to the surface a composition having the following proportions:

40 grams	zinc oxide (photoconductor)
2.5 grams	vinyl resin comprising Vinyl Chloride-acetate, such as that known under the Trade Mark Vinylite VYHI of Union Carbide Co. (resin fixer and insulator)

-Continued

250 ml.	Hydrocarbon solvent, such as that known under the Trade Mark Esso 100 (Standard Oil Co.) flash point 108°F, KB value 91
1 ml.	Dye solution comprising 1% solution by weight of spirit nigrosin black dissolved in methyl alcohol (colouring medium)

These components are milled in a ball mill for 10 hours to form a particulate coating base. This coating base is dispersed in a hydrocarbon solvent such as that known under the Trade Mark Isopar G (a hydrocarbon solvent greater than 95 percent isoparaffinic) by further ball milling in the proportions of 10 grams of the base to 1 litre of Isopar G. The so-formed dispersion is used in the coating station of the machine. The washing station uses a hydrocarbon solvent such as that known under the Trade name of Esso 100.

EXAMPLE 2

A blue coating is formed on a sheet by applying to the surface a composition having the following ingredients in the following proportions:

10 grams	zinc oxide
2 grams	copolymer polyvinyl butyral resin such as that known under the Trade Mark MOWITAL B60H
5 grams	Methyl ethyl ketone
1 gram	hydrocarbon oil, such as that known under the Trade name Fusus A product of the Shell Co.
1 ml.	Dye solution comprising 1% solution by weight of disulphine blue.

These components are milled in a ball mill for 10 hours to form a particulate coating base. The coating base is dispersed in a hydrocarbon solvent such as that known under the Trade Mark Isopar G, previously referred to, by further ball milling in the proportions 10 grams of the base to 1 litre of Isopar G. The so-formed dispersion is used in the coating station of the machine.

The washing station uses Isopar G solvent containing 1 per cent by volume of methyl ethyl ketone.

EXAMPLE 3

In Example 2, replace disulphine blue by erythrosin B, or Rose Bengal, or Brilliant Green, or Fuchsin, or Erioglaucine Blue.

EXAMPLE 4

In Example 2, replace MOWITAL B60H resin with paraffin wax, or chlorinated diphenyl, or phenolphthalein, or Gum copal or the like.

EXAMPLE 5

In Example 2, replace the MOWITAL B60H resin with ester gum.

I claim:

1. The method of producing electrostatic images in a machine comprising,
 - a. feeding a sheet, such as pre-cut or continuous paper, into said machine,
 - b. applying to said sheet a colored photoconductive medium to form a uniform photoconductive film over the surface of said sheet,
 - c. charging the said photoconductor electrically in the dark to hold said photoconductor to said sheet while dark conditions are maintained,
 - d. exposing the said photoconductor film to electromagnetic waves to produce a latent image on said

photoconductor film by discharging the photoconductor in non-image areas,

e. subjecting the imaged photoconductor film while still under dark conditions to a selective washing action to remove the said photoconductor film from the non-image areas to leave a visible image in the image areas, and

f. fixing the said photoconductive image by using in the washing action an insulating liquid which is a softener for the photoconductive medium to render the medium adhesive to the said sheet where held by the latent image.

2. The method of claim 1 wherein the photoconductive medium comprises photoconductive particles having an insulating coating including a colouring medium to produce the coloured photoconductive particles, and characterised in that the coloured photoconductive particles are suspended in an insulating carrier liquid prior to application to the said sheet.

3. The method of claim 1 wherein the photoconductive medium comprises photoconductive particles having an insulating coating including a colouring medium to produce the coloured photoconductive particles, characterised in that the coloured photoconductive particles are suspended in an insulating carrier liquid prior to application to the said sheet, and the said coating on the particles so produced is relatively insoluble in the said carrier liquid.

4. The method of claim 1 wherein the photoconductive medium comprises photoconductive particles having an insulating coating including a colouring medium to produce the coloured photoconductive particles, characterised in that the coloured photoconductive particles are suspended in an insulating carrier liquid prior to application to the said sheet and the said coating on the particles is relatively insoluble in the said carrier liquid, further characterised in that the selective removal of the photoconductive film from the non-image areas is effected by washing with a liquid which is a partial solvent for the said coating on the particles to render the coating tacky whereby the particles remaining on the image area bond to the sheet when the sheet surface is dried to remove the washing liquid.

5. The method of claim 1 characterised by applying to said sheet a coloured photoconductive medium to form a uniform photoconductive film over the surface of said sheet, said photoconductor being particulate and having a coating of coloured insulating medium on said particles, charging the said photoconductor electrically in the dark to hold said photoconductor to said sheet by electrostatic attraction while dark conditions are maintained, exposing the said photoconductor film to electro-magnetic waves to produce a latent image on said photoconductor film by discharging the photoconductor in non-image areas and thus terminating the electrical hold but maintaining the photoconductor in place by surface tension due to the presence of a wetting liquid, subjecting the imaged photoconductor film while still under dark conditions to a washing action to remove the said photoconductor film from the non-image areas to leave a visible image in the image areas, using as the washing liquid an insulator medium which softens the insulating medium on the photoconductive particles to fix the particles to the sheet when the washing liquid is removed, and drying the said sheet to remove the said liquid.

6. The method of claim 1 wherein the photoconductive medium comprises photoconductive zinc oxide particles having an insulating coating ground on to the zinc oxide while the coating medium is in solution and including a colouring medium to produce the coloured insulated photoconductive particles, and characterised in that the coloured photoconductive particles are suspended in an insulating carrier liquid prior to application to the said sheet.

7. The method of claim 1 wherein the photoconductive medium comprises photoconductive zinc oxide particles coated with an insulating resin or wax or gum, by grinding in a solvent for the resin or wax or gum and including a colouring medium to produce the coloured photoconductive particles, the said coloured photoconductive particles so produced being suspended in a hydrocarbon carrier liquid prior to application to the said sheet, the said coating on the particles so produced being relatively insoluble in the said hydrocarbon carrier liquid.

8. The method of claim 1 wherein the photoconductive medium comprises photoconductive zinc oxide particles having an insulating of resin or wax or gum and including a colouring medium to produce the coloured photoconductive particles, characterised in that the coloured photoconductive particles are suspended in an insulating carrier liquid prior to application to the said sheet and the said coating on the particles is relatively insoluble in the said carrier liquid, further characterised in that the selective removal of the photoconductive film from the non-image areas is effected by washing with a liquid which is a partial solvent for the said coating to render the coating tacky whereby the particles remaining on the image area bond to the sheet when the sheet surface is dried to remove the washing liquid.

9. The method of claim 1 characterised by applying to said sheet a coloured photoconductive medium to form a uniform photoconductive film over the surface of said sheet, said photoconductor being particulate photoconductive zinc oxide having a coating of insulating material on said particles formed by grinding the zinc oxide with a dissolved resin or wax or gum taken from the group comprising a vinyl resin, a copolymer polyvinyl resin, a paraffin wax, a chlorinated diphenyl, phenolphthalein, gum copal, or ester gum, and including a colouring medium taken from the group of Nigrosin Black, Disulphine Blue, Erythrosin B, Rose Bengal, Brilliant Green, Fuchsin, or Erioglaucine Blue, charging the said photoconductor particles so produced electrically in the dark while suspended in an insulating liquid to hold said photoconductor to said sheet by electrostatic attraction while dark conditions are maintained, exposing the said photoconductor film to electro-magnetic waves to produce a latent image on said photoconductor film by discharging the photoconductor in non-image areas and thus terminating the electrical hold but maintaining the photoconductor in place by surface tension due to the presence of the insulating liquid, subjecting the imaged photoconductor film while still under dark conditions to a washing action to remove the said photoconductor film from the non-image areas to leave a visible image in the image areas, and fixing the said photoconductive image by using as the washing liquid an insulator medium which softens the coating on the photoconductive particles and then drying the said particles.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,790,375 Dated February 5, 1974

Inventor(s) Alan J. Brock

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 17, change "blank" to -- bank --

Column 2, line 32, change "blank" to -- bank --

Column 2, line 57, change "Jhat" to -- that --

Column 6, line 36, change " now" to -- how --

Column 6, line 57, change "perfereably" should read
-- preferably -- .

Signed and sealed this 6th day of August 1974.

SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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