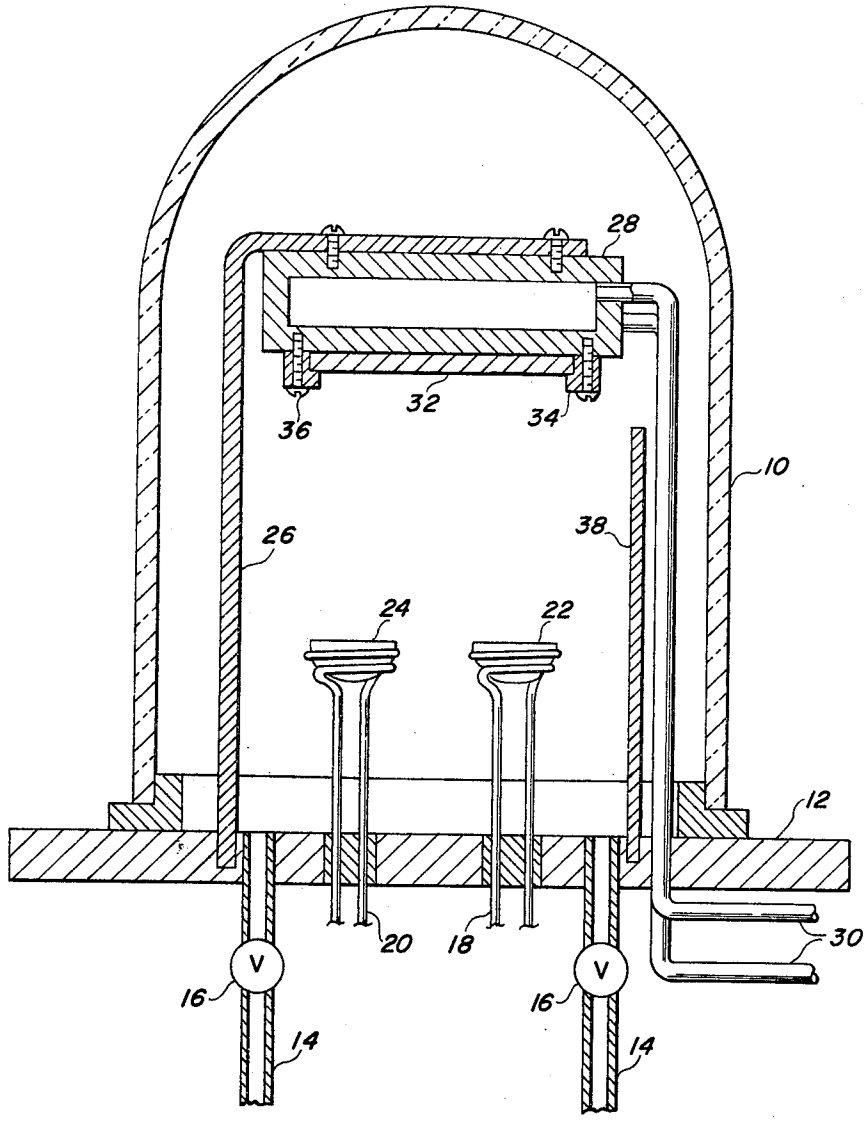
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PHOTOCONDUCTIVE LAYER COMPRISING A SELENIUM COMPOUND AND A SOLID HYDROPHOBIC METAL SALT OF A FATTY ACID

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PHOTOCONDUCTIVE LAYER COMPRISING A SELENIUM COMPOUND AND A SOLID HYDROPHOBIC METAL SALT OF A FATTY ACID

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ABSTRACT OF THE DISCLOSURE

An electrophotographic plate is produced by co-evaporation of a selenium material and a solid hydrophobic metal salt of a fatty acid onto a conductive substrate. The plate may be used in conventional electrophotographic processes and is useful in automatic xerographic equipment.

This invention relates in general to imaging systems and, more particularly, to improved imaging materials, their manufacture and use.

The formation and development of images on the surface of photoconductive materials by electrostatic means is well known. The basic xerographic process, as taught by C. F. Carlson in U.S. Patent 2,297,691, involves placing a uniform electrostatic charge on a photoconductive insulating layer, exposing the layer to a light and shadow image to dissipate the charge on the areas of the layer exposed to the light and developing the resulting latent electrostatic image by depositing on the image a finely-divided electroscopic material referred to in the art as "toner". The toner will normally be attracted to those areas of the layer which retain a charge, thereby forming a toner image corresponding to the latent electrostatic image. This powder image may then be transferred to a support surface such as paper. The transferred image may subsequently be permanently affixed to the support surface as by heat. Other suitable fixing means such as solvent or overcoating treatment may be substituted for the foregoing heat fixing steps. Many methods are known for applying the electroscopic particles to the latent electrostatic images to be developed. One development method as disclosed by E. N. Wise in U.S. Patent 2,618,552 is known as "cascade" development. In this method, developer material comprising relatively large carrier particles having finely-divided toner particles electrostatically clinging to the surface of the carrier particles is conveyed to and rolled or cascaded across the latent electrostatic image-bearing surface. The composition of the toner particles is so chosen as to have a triboelectric polarity opposite that of the carrier particles. As the mixture cascades or rolls across the image-bearing surface, the toner particles are electrostatically deposited and secured to the charged portions of the latent image and are not deposited on the uncharged or background portions of the image. Most of the toner particles accidentally deposited in the background are removed by the rolling carrier, due apparently, to the greater electrostatic attraction between the toner and the carrier than between the toner and the discharged background. The carrier particles and unused toner particles are then recycled. This technique is extremely good for the development of line copy images. The cascade development process is the most widely used commercial xerographic development technique. A general purpose office copying machine incorporating this technique is described in U.S. Patent 3,099,943.

Another technique for developing electrostatic images is the "magnetic brush" process as disclosed, for example, in U.S. Patent 2,874,063. In this method, a developer material containing toner and magnetic carrier particles is carried by a magnet. The magnetic field of the magnet causes alignment of the magnetic carriers in a brush-like configuration. This "magnetic brush" is engaged with an electrostatic image-bearing surface and the toner particles are drawn from the brush to the electrostatic image by electrostatic attraction. Many other methods are known for applying electroscopic particles to the latent electrostatic image to be developed. These methods include: "powder cloud" development, "touchdown" development and "liquid" development as described in U.S. Patents 2,221,776; 2,895,847; and 2,891,911, respectively. The processes as mentioned above together with numerous variations are well known to the art through various patents and publications and through the wide spread availability and utilization of electrostatographic imaging equipment.

In automatic xerographic equipment, it is conventional to employ a xerographic plate in the form of a cylindrical drum which is continuously rotated through a cycle of sequential operations including charging, exposure, developing, transfer and cleaning. The plate is usually charged with corona of positive polarity by means of a corona generating device of the type disclosed by L. E. Walkup in U.S. Patent 2,777,957 which is connected to a suitable source of high potential. After forming a powder image on the electrostatic latent image during the development step, the powder image is electrostatically transferred to a support surface by means of a corona generating device such as the corona device mentioned above. In automatic equipment employing a rotating drum, a support surface to which a powdered image is to be transferred is moved through the equipment at the same rate as the periphery of the drum and contacts the drum in 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 effect development. For example, where a positive reproduction is to be made of a positive original, it is conventional to employ a positive polarity corona to effect transfer of a negatively charged toner image to the support surface. When a positive reproduction from a negative original is desired, it is conventional to employ a positively charged developing material which is repelled by the charged areas on the plate to the discharged areas thereon to form a positive image which may be transferred by negative polarity corona. In either case, a residual powder image usually remains on the plate after transfer. Because the plate may be reused for a subsequent cycle, it is necessary that the residual image be removed to prevent ghost images from forming on subsequent copies. In the positive-to-positive reproduction process described above, the residual developer powder is tightly retained on the plate surface by a phenomenon that is not fully understood but believed caused by an electric charge that prevents complete transfer of the powder to a support surface, particularly in the image areas. The charge is substantially neutralized by means of a corona generating device prior to contact of the residual powder image with a cleaning device. The neutralization of the charge enhances the cleaning efficiency of the cleaning device.

Typical electrostatographic plate cleaning devices include the "brush" type cleaning apparatus and the "web" type cleaning apparatus. A typical brush cleaning apparatus is disclosed by L. E. Walkup et al. in U.S. Patent

2,832,977. The brush type cleaning means usually comprises one or more rotating brushes which brush residual powder from the plate into a stream of air which is exhausted through a filtering system. A typical web cleaning device is disclosed by W. P. Graff, Jr., et al. in U.S. Patent 3,186,838. As disclosed by Graff, Jr., et al., removal of the residual powder on the plate is effected by rubbing a web of fibrous material against the plate surface. These inexpensive and disposable webs of fibrous material are advanced into pressure and rubbing or wiping contact with the imaging surface and are gradually advanced to present a clean surface to the plate whereby substantially complete removal of the residual powder from the plate is effected.

While ordinarily capable of producing good quality images, conventional developing systems suffer serious deficiencies in certain areas. The electrical and transfer characteristics of electrostatic imaging surfaces are adversely affected when relative humidity is high. Because of the influence of various forces such as electrostatic and van der Waal forces, many toner particles tend to form adherent unwanted deposits which impair proper cleaning of reusable imaging plates, belts or drums. Numerous known carriers are abrasive in nature. Abrasive contact between toner particles, carriers, and imaging surfaces, accelerates mutual deterioration of these components. Rubbing contact between cleaning devices and the imaging surface also results in rapid erosion of the imaging surfaces. Frequent replacement of carriers and imaging plates is expensive, inconvenient and time consuming. Fines formed from the attrition of toner on rough imaging surfaces tend to drift and form unwanted deposits on critical machine parts. Electrostatographic copies should possess good line image contrast as well as acceptable solid area coverage. However, when a process is designed to improve either line image contrast or solid area coverage, reduced quality of the other can be expected. Attempts to increase image density by depositing greater quantities of toner particles on the latent electrostatic image are usually rewarded with an undesirable increase in background deposits. Further, for reasons not fully understood, image quality is often impaired by the appearance of powder deficient spots in the powder image. Although the present selenium xerographic plates possess good temperature stability, the vitreous selenium layer tends to crystallize under high temperature conditions with attendant degradation of imaging qualities. In addition, difficulty is often encountered in maintaining a good bond between vitreous selenium layers and conductive substrates, particularly where the conductive substrates are flexible. Thus, there is a continuing need for a better system for developing latent electrostatic images.

It is, therefore, an object of this invention to provide a system which overcomes the above noted deficiencies.

It is another object of this invention to improve the adhesion of selenium layers to conductive substrates.

It is a further object of this invention to provide electrophotographic plates having stable electrical properties.

It is a still further object of this invention to provide electrophotographic plates which enhance the transfer of toner particles in background areas of imaged surfaces to carriers.

It is another object of this invention to provide an electrophotographic plate from which toner particles are easily removed by cleaning devices.

It is still another object of this invention to provide electrophotographic plates which are resistant to mechanical abrasion.

It is a further object of this invention to provide electrophotographic plates which promote the formation of dense transferred toner images.

It is a still further object of this invention to provide an electrophotographic plate which reduces or eliminates powder deficient spots.

It is another object of this invention to provide an electrophotographic plate having physical and chemical properties superior to those of known electrophotographic plates.

The above object and others are accomplished, generally speaking, by providing a photoconductor formed by condensing the co-evaporated vapors of selenium compositions and a hydrophobic metal salt of a fatty acid having a melting point of from about 30° C. to about 80° C. on a substrate. The condensed vapors of the components appear to be randomly mixed to form a continuous film on the substrate. These films may be formed in any convenient thickness. Although thicknesses of several hundred angstroms may be formed, films ranging from about 1,000 angstroms to about 100 microns, are preferred for photoconductive applications. Satisfactory results are obtained with photoconductive layers comprising up to about 20 percent, based on the weight of the ultimate mixture, of the metal salt. Optimum results are obtained when the photoconductive layer contains about 2 percent to about 5 percent of the metal salt. Although the initial electrostatic imaging surface potential may be reduced and abrasion resistance improved when the proportion of metal salt present is increased above about 20 percent, undesirable background deposits increase noticeably. If the charge voltage is reduced to compensate for the presence of zinc stearate in excess of about 20 percent, the images begin to acquire a "washed out" appearance. When less than about 0.1 percent metal salt based on the total weight of the photoconductive layer is employed, the abrasion resistance, transfer characteristics and image forming properties are substantially the same as a photoconductive layer which does not contain the metal salt.

Although the initial deposit on the substrate may contain both the photoconductive component and the metal salt, it is preferred that vaporation of the selenium photoconductor component be initiated prior to vaporization of the metal salt. This embodiment is preferred because a greater surface area of photoconductive selenium material is presented for electrical contact with the conductive substrate. Further, initiation of selenium photoconductor evaporation prior to vaporization of the metal salt prevents the less desirable occurrence of a continuous film of metal salts on the surface of the conductive substrate prior to deposition of the selenium photoconductive material. The formation of a continuous metal salt film on the conductive substrate prior to deposition of any selenium photoconductive material is undesirable, because it tends to insulate the selenium photconductive material from the conductive substrate and also reduces adhesion of the selenium photoconductive material to the substrate.

The photoconductive films of this invention may be formed on any suitable conductive substrate. Typical conductive substrates include brass, aluminum, gold, platinum, steel, glass coated with conductive oxides, metallized paper, laminated sheets of metal and plastic and the like. The conductive substrate may be in the form of a flat plate, cylinder, flexible sheet or any other suitable configuration.

Excellent results are obtained with zinc stearate. However, any suitable stable solid hydrophobic metal salt of a fatty acid having a melting point greater than about 30° C. may be substituted for zinc stearate. The metal salts should be substantially insoluble in water. Photoconductive plates containing water soluble metal salts lack the proper electrical properties and are adversely affected by humidity changes normally occurring in the ambient atmosphere. A great many salts commonly regarded as insoluble, actually dissolve to a slight extent. To effectively carry out the purposes of this invention, the water solubility of the salt should be negligible. The salts having the desired specific characteristics include many salts of saturated fatty acids, unsaturated fatty acids, par-

tially hydrogenated fatty acids, substituted fatty acids and mixtures thereof. Typical fatty acids from which stable solid hydrophobic metal salts may be derived include: caproic acid, enanthlic acid, caprylic acid, pelargonic acid, capric acid, undecylic acid, lauric acid, tridecoic acid, myristic acid, pentadecanoic acid, palmitic acid, mergaric acid, stearic acid, nondecyclic acid, arachidic acid, behenic acid, stillingic acid, palmitoleic acid, oleic acid, ricinoleic acid, petroselinic acid, vaccenic acid, linoleic acid, linolenic acid, eleostearic acid, licanic acid, parinaric acid, gadoleic acid, arachidonic acid, cetoleic acid and mixes thereof. Typial stable solid metal salts of fatty acid include: barium stearate, lead stearate, iron stearate, nickel stearate, cobalt stearate, copper stearate, strontium stearate, calcium stearate, cadmium stearate, magnesium stearate, zinc oleate, manganese oleate, iron oleate, cobalt oleate, copper oleate, lead oleate, magnesium oleate, zinc palmitate, cobalt palmitate, copper palmitate, magnesium palmitate, aluminum palmitate, calcium palmitate, lead caprylate, lead caproatae, zinc linoleate, cobalt linoleate, calcium linoleate, zinc ricinoleate, cadmium ricinoleate, and mixtures thereof.

Optimum results are obtained when the photoconductive layer contains the metal salt and selenium. However, photoconductvie mixtures, alloys or compounds of selenium with another material such as tellurium and arsenic may be substituted for selenium.

The advantages of this method will become further apparent upon consideration of the following disclosure of the invention, particularly when taken in conjunction with the accompanying drawing wherein an embodiment of an apparatus for preparing thin films comprising vitreous selenium and a solid hydrophobic metal salt of a fatty acid is illustrated.

In the drawing, bell jar **10** is supported by a plate **12** containing vacuum lines **14** and control valve **16**. Resistance heating wires **18** and **20** are employed to heat crucibles **22** and **24**, respectively. A rod **26** is employed to support a fluid cooled platen **28**. The fluid cooled platen **28** is provided with a fluid supply tubes **30**. The substrate **32** to be coated is mounted on the lower face of platen **28** by a masking frame **34** secured to the platen **28** by, for example, screws **36**. Supply tubes **30** are shielded from vapors by plate **38**.

The selenium or selenium alloy and the solid hydrophobic metal salt of a fatty acid are each placed in separate crucibles composed of inert material such as quartz or other suitable refractory material.

The pressures within bell jar **10** is maintained at a vacuum of about 2×10^{-5} to 2×10^{-8} torr. However, a vacuum above or below this range can also be employed with satisfactory results. A relatively low substrate temperature such as, for example, from about 40° C. to 90° C. may be employed to condense the vapors. The temperature of the components in crucibles **22** and **24** are maintained at a temperature between about their melting points and their boiling points. Thus, for example, in forming a selenium zinc stearate photoconductive film containing about 98 percent, by weight, selenium and about 2 percent, by weight, zinc stearate, a temperature of about 217° C. for the selenium and about 130° C. for the zinc stearate is satisfactory. When a larger proportion of selenium in the film is desired, the temperature of the crucible containing selenium should be increased and/or the temperature of the crucible containing zinc stearate reduced. To increase the relative quantity of zinc stearate in the photoconductive film, the above described temperature regulation is reversed.

Under the above conditions, a film thickness of about 5 to about 30 microns is obtained for deposition periods ranging from about 1 to about 3 hours at a vacuum of about 2×10^{-5} torr. In view of the above described procedure, it is apparent that the amount of a particular component in the photoconductive film is primarily dependent upon the temperature employed to vaporize each of the components at a given pressure.

The unexpectably better results obtained by co-evaporating a solid hydrophobic metal salt of a fatty acid with selenium or selenium alloys may be due to many factors. For example, it is postulated that the slippery metal salt material reduces friction during the development and cleaning processes; reduces the attraction of toner particles to the imaging surface during image transfer thereby improving print density; provides at least a partially waterproof photoconductor surface which permits electrical stability under varying humidity conditions; and is constantly brought to the surface of the photoconductor throughout the life of the photoconductor layer as the photoconductor layer is slowly worn away during use.

Although specific materials and conditions are set forth in the above examples, these are merely illustrative of the present invention. Various other compositions such as the typical materials listed above and various conditions when suitable may be substituted for those given in the examples with similar results. The photoconductive layer of this invention may contain other materials co-deposited therewith to enhance, sensitize, synergize or otherwise modify the photoconductive properties of the composition.

Many other modifications of the present invention will occur to those skilled in the art upon a reading of this disclosure. These are intended to be encompassed within the spirit of this invention.

The following examples further specifically define and describe the process of the present invention for forming photoconductive layers comprising selenium and a solid hydrophobic metal salt of a fatty acid. Parts and percentages are by weight unless otherwise indicated. The examples below are intended to illustrate the various preferred embodiments of carrying out the invention.

EXAMPLE I

Two quartz crucibles are charged with finely-divided ball milled selenium and zinc stearate, respectively. These crucibles are placed in resistance heaters positioned in a vacuum chamber similar to the chamber illustrated in the drawing. The vacuum chamber is evacuated to a vacuum of about 2×10^{-5} torr. A brass substrate is secured to a water cooled platen located about 12 inches above the quartz crucibles and maintained at a temperature of about 54° C. The selenium and zinc stearate are then evaporated onto the brass plate surface by maintaining the temperature of the selenium crucible at about 217° C. and the zinc stearate crucible at about 130° C. by means of the resistance heating elements. These conditions are maintained for about 2½ hours at which time vaporation is terminated. After the vacuum chamber is cooled to room temperature and the vacuum broken, the coated brass plate is removed from the chamber. No crystallinity is detected in the deposited film when examined by X-ray diffraction.

EXAMPLE II

The procedure described in Example I is repeated except that no zinc stearate is employed. The resulting photoconductive plate is compared to the photoconductive plate of Example I by utilizing each of the plates in a xerographic copying process in the following manner. Each photoconductive plate is corona charged to a voltage of about 600 volts and exposed to identical light and shadow patterns to form a latent electrostatic image on their surfaces. The latent images are then developed by cascading a mixture of colored polystyrene copolymer toner particles having an average particle size of about 10 to about 20 microns and 99 parts coated carrier particles having an average particle size of about 600 microns across the surface bearing the latent image. The image is then transferred to a sheet of paper and heat fused

thereon to render it permanent. Both copies possess sharp line contrast but the copy produced with the photoconductive plate containing zinc stearate possessed higher density solid area coverage and cleaner background than the copy produced with the zinc stearate free photoconductive plate.

EXAMPLE III

The procedure employed in Example I is repeated with calcium stearate substituted for zinc stearate. The resulting photoconductive plate is corona charged to a voltage of about 600 volts and exposed to a light and shadow pattern to form a latent electrostatic image on its surface. The latent image is then developed by cascading a mixture of colored polystyrene copolymer toner particles having an average particle size of about 10 to about 20 microns and 99 parts coated carrier particles having an average particle size of about 600 microns across the surface bearing the latent image. The resulting powder image is then transferred to a sheet of paper and heat fused thereon to render it permanent. This copy is compared to the copy obtained with the salt-free selenium plate described in Example II. The copy obtained with the calcium stearate plate possessed higher density solid area coverage and cleaner background than the copy produced with the salt-free photoconductive plate described in Example II.

EXAMPLE IV

The procedure employed in Example I is repeated with barium laurate substituted for zinc stearate. The resulting photoconductive plate is corona charged to a voltage of about 600 volts and exposed to a light and shadow pattern to form a latent electrostatic image on its surface. The latent image is then developed by cascading a mixture of colored polyethylene toner particles having an average particle size of about 5 to about 15 microns and 95 parts coated carrier particles having an average particle size of about 400 microns across the surface bearing the latent electrostatic image. The resulting powder image is then transferred to a sheet of paper and heat fused thereon to render it permanent. This copy is compared to the copy obtained with the salt-free selenium plate described in Example II. The copy obtained with the barium laurate plate possessed higher density solid area coverage and cleaner background than the copy produced with the salt-free photoconductive plate described in Example II.

EXAMPLE V

Two molybdenum crucibles are charged with finely-divided mixture of about 95 parts selenium and about 5 parts arsenic trisulfide and zinc stearate, respectively. These crucibles are placed in resistance heaters positioned in a vacuum chamber similar to the chamber illustrated in the drawing. The vacuum chamber is evacuated to a vacuum of about 2×10^{-4} torr. An aluminum substrate is secured to a water cooled platen located about 4 inches above the molybdenum crucibles and maintained at a temperature of about 80° C. The selenium, arsenic trisulfied and zinc stearate are then evaporated onto the aluminum surface by maintaining the temperature of the crucible containing the mixture of selenium and arsenic trisulfied at about 220° C. and the crucible containing zinc stearate at about 130° C. by means of the resistance heating elements. These conditions are maintained for about 0.5 hour at which time vaporization is terminated. After the vacuum chamber is cooled to room temperature and the vacuum broken, the brass plate is removed from the chamber. No crystallinity is detected in the deposited film when examined by X-ray deffraction.

EXAMPLE VI

The procedure described in Example V is repeated except that no zinc stearate is employed. The resulting photoconductive plate is compared to the photoconductive plate of Example V by utilizing each of the plates in a xerographic copying process in the following manner. Each photoconductive plate is corona charged to a voltage of about 600 volts and exposed to identical light and shadow patterns to form a latent electrostatic image on their surfaces. The latent images are then developed by cascading a mixture of colored polystyrene copolymer toner particles having an average particle size of about 10 to about 20 microns and 99 parts coated carrier particles having an average particle size of about 600 microns across the surface bearing the latent image. The image is then transferred to a sheet of paper and heat fused thereon to render it permanent. Both copies possess sharp line contrast but the copy produced with the photoconductive plate containing zinc stearate possess higher density solid area coverage and cleaner background than the copy produced with the photoconductive plate which did not contain zinc stearate.

EXAMPLE VII

The procedure employed in Example V is repeated with zinc oleate substituted for zinc stearate. The resulting photoconductive plate is corona charged to a voltage of about 600 volts and exposed to a light and shadow pattern to form a latent electrostatic image on its surface. The latent image is then developed by cascading a mixture of colored polystyrene copolymer toner particles having an average particle size of about 10 to about 20 microns and 99 parts coated carrier particles having an average particle size of about 600 microns across the surface bearing the latent image. The resulting powder image is then transferred to a sheet of paper and heat fused thereon to render it permanent. This copy is compared to the copy obtained with the salt-free photoconductive plate described in Example VI. The copy obtained with the zinc oleate plate possessed higher density solid area coverage and cleaner background than the copy produced with the salt-free photoconductive plate.

EXAMPLE VIII

The procedure described in Example II is repeated except that the xerographic copying process is conducted in a chamber maintained at about 80° F. and about 80 percent relative humidity. Both the developing material and the two plates are maintained within the humidity chamber at 80° F. and about 80 percent relative humidity for approximately 20 hours immediately prior to utilizing each of the plates in a xerographic copying process. The copies produced with the stearate-free photoconductive plate possess good good line contrast but poor solid area coverage. Copies produced with the plate containing zinc stearate possess excellent line contrast and very good solid area coverage.

EXAMPLE IX

The zinc stearate free and zinc stearate treated plates described in Example II are subjected to about 10,000 imaging cycles; each cycle comprising a charging step, an exposure step, a developing step and a transfer step as described in Example II. A cleaning step is also included in the cycle and comprises wiping the surface of plates with cotton to remove any residual toner material which is not removed during the transfer step. Micrograph studies of the imaging surfaces of the plates reveal substantially less wear and a greatly fewer number of deep scratches in the zinc stearate treated plate than in the untreated plate.

EXAMPLE X

The calcium stearate free and calcium oleate treated plates described in Example III are subjected to about 10,000 imaging cycles; each cycle comprising the steps described in Example IX. Micrograph studies of the imaging surfaces of the plates reveal less wear and shallower scratches in the treated plate than in the untreated plate.

EXAMPLE IX

The zinc oleate free and zinc oleate treated plates described in Example VII are subjected to about 10,000

imaging cycles; each cycle comprising the steps described in Example IX. Micrograph studies of the imaging surfaces of the plates reveal reduced wear and fewer scratches in the zinc oleate treated plate than in the untreated plate.

The expression "electrophotographic plate" as employed herein is intended to include flat plates, cylinders and continuous belts.

Although specific components, proportions and procedures have been stated in the above description of the preferred embodiments of the novel treatment system, other suitable materials, as listed above, may be used with similar results. Further, other materials and procedures may be employed to synergize, enhance or otherwise modify the novel system. Other modifications and ramifications of the present invention will appear to those skilled in the art upon a reading of the disclosure. These are intended to be included within the scope of this invention.

What is claimed is:

1. A process for the production of an electrophotographic plate which comprises:

(a) simultaneously heating a photoconductive material selected from the group consisting of selenium, selenium compounds and selenium alloys and a solid hydrophobic metal salt of a fatty acid under vacuum conditions to form vapors of said photoconductive material and said solid hydrophobic metal salt of a fatty acid and

(b) simultaneously condensing the vapors of said photoconductive material and said hydrophobic metal salt of a fatty acid onto a cold conductive substrate maintained at a temperature below the melting point of said photoconductive material and said solid hydrophobic metal salt of a fatty acid whereby a continuous photoconductive layer is formed on said substrate.

2. A process for the production of an electrophotographic plate according to claim **1** including initiating vaporization of said photoconductive material prior to coevaporization of said photoconductive material and said solid hydrophobic metal salt of a fatty acid whereby at least a portion of said vaporized photoconductive material is deposited on said cold conductive substrate prior to deposition of said solid hydrophobic metal salt of a fatty acid.

3. An electrophotographic plate comprising a photoconductive layer on a supporting conductive substrate, said layer comprising a photoconductive material selected from the group consisting of selenium, selenium compounds and selenium alloys and a solid hydrophobic metal salt of a fatty acid.

4. An electrophotographic plate according to claim **3** wherein said photoconductive layer comprises from about 99.9 to about 80 parts by weight of said photoconductive material and from about 0.1 to about 20 parts by weight of said solid hydrophobic metal salt of a fatty acid.

5. An electrophotographic plate according to claim **3** wherein said solid hydrophobic metal salt of a fatty acid is zinc stearate.

6. An electrophotographic plate according to claim **3** wherein said layer comprises a greater concentration of said photoconductive material adjacent said supporting conductive substrate than elsewhere in said photoconductive layer.

7. A process for forming a latent electrostatic charge pattern on a surface including the steps of providing an electrophotographic plate comprising a photoconductive layer on a supporting conductive substrate, said layer comprising a photoconductive material selected from the group consisting of selenium, selenium compounds and selenium alloys and a solid hydrophobic metal salt of a fatty acid, uniformly electrostatically charging said photoconductive layer, and exposing said photoconductive layer to a pattern of activating electromagnetic radiation to thereby form a latent electrostatic image on said photoconductive layer.

8. An electrophotographic imaging process including the steps of providing an electrophotographic plate comprising a photoconductive layer on a supporting substrate, said layer comprising a photoconductive material selected from the group consisting of selenium and selenium alloys and a solid hydrophobic metal salt of a fatty acid, electrostatically charging said photoconductive layer, exposing said layer to an electromagnetic image pattern to be reproduced to thereby form a latent electrostatic image on said photoconductive layer, and developing said latent electrostatic image with electroscopic marking particles.

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