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PROCESS FOR THE REMOVAL OF UNFIXED DEVELOPER POWDER FROM POWDERED ELECTRO-PHOTOGRAPHIC REPRODUCTION COATINGS

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In the electrophotographic process for the production of images, the latent image produced by the exposure to light of the electrostatically charged photoconductive coating has to be developed, a process which generally takes the form of powdering over with a pigmented developer, and then fixed, so that the powder image becomes fused, and therefore adheres permanently to the support. The fixing of the image may be carried out directly, i.e., the image may be fixed to the surface on which it is originally produced, e.g. the powder image may be fused by heat or sprayed with a solvent for the powder, or it may be transferred to a transfer material, e.g. paper or plastic foil, and fixed on the new support. When the image is transferred, clearly detectable quantities of the pigmented developer are frequently left behind and it is sometimes of interest that those quantities should be removed.

For other reasons, too, it is often desirable for the operator to be able to free the electrophotographic reproducing coating of the unfixed pigmented developer powder adherent thereto. This is the case, for example, if defective parts have to be removed from the image. In the case of electrophotographic material made of selenium, and equivalent substances, efforts are directed, in the interests of economy, toward the restoration of the photoconductive material to its original state, after the powder image has been transferred, so that the material can be recharged and used for the production of a fresh image.

The present invention is concerned with a process for the removal of the unfixed powder developer from powdered electrophotographic reproduction coatings, in which process the pigmented developer is removed in simple manner without the surface of the coating undergoing damage. The process accordant with the invention consists in the treatment of the unfixed powdered electrophotographic coating with a mixture consisting of readily dispersible parts of kieselguhr and etherified cellulose, with the possible addition of non-etherified cellulose.

All types of kieselguhr are suitable for the mixture accordant with the invention. Purified kieselguhr is preferable, e.g. kieselguhr purified by treatment with hydrochloric acid and then calcined. Silicagel, which is no natural silica substance, is also suitable. Examples of etherification products of cellulose are cellulose alkyl ethers such as methyl cellulose, ethyl cellulose, hydroxy ethyl cellulose, methylhydroxy ethyl cellulose, as also benzyl cellulose and cellulose ether carboxylic acids and their salts, e.g. cellulose glycolic acid and its sodium salt. The proportions of the components of the mixture used as cleaning agent can vary within wide limits. From one to two parts of kieselguhr to one part of cellulose component have proved advantageous.

The preferred average grain size of the kieselguhr is from about 5 to about 20μ and of the cellulose component from about 200 to about 600μ.

The manner in which the process is carried out is as follows: either the mixture accordant with the invention is caused to disperse over the powdered unfixed electrophotographic reproduction coating or over parts thereof from which pigmented developer is required to be removed, or the electrophotographic sheet is drawn through the mixture. No cracking or scratching of the surface of the coating occurs so that the next electrostatic images are not rendered defective.

The invention will be further illustrated by reference to the following specific examples:

Example 1

A mixture consisting of 100 parts of kieselguhr and 50 parts of methylhydroxyethyl cellulose is dispersed over an aluminum plate having a vacuum-deposited selenium coating carrying an unfixed electrostatic powder image. One passage over the electrostatic powder image is sufficient to remove all visible traces of powder, while the selenium coating is unaffected.

Example 2

A mixture consisting of 100 parts of methyl cellulose and 100 parts of kieselguhr is dispersed over paper coated with zinc oxide and carrying a non-fixed electrostatic powder image. The electrostatic powder image is thereby quickly removed.

Example 3

After the production of an electrostatic powder image on an aluminum foil coated with a photoconductive organic substance—2,5 - bis-(4'-diethylamino-phenyl-(1'))-1,3,4-oxadiazole may, for example, be present in the coating—the foil is drawn through a mixture consisting of 50 parts of ethyl cellulose and 50 parts of kieselguhr. The electrostatic powder image is thereby quickly removed.

Example 4

A mixture composed of 50 parts of cellulose, 50 parts of carboxymethyl cellulose and 50 parts of kieselguhr is dispersed over a paper coated with zinc oxide and carrying a non-fixed powder image. The electrostatic powder image is removed and the coating remains unharmed. Instead of carboxymethyl cellulose, benzyl or hydroxyethyl cellulose may be used.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof, and the invention includes all such modifications.

What is claimed is:

1. A process for the removal of unfixed powder developer from powdered electrophotographic reproduction coatings which comprises treating the coating with a mixture of finely divided kieselguhr and finely divided etherified cellulose.

2. A process according to claim 1 in which the mixture also contains non-etherified cellulose.

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