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METHOD OF REMOVING ELECTROSCOPIC
POWDER FROM AN ELECTROPHOTO-
GRAPHIC PLATE

Harold E. Copley, Columbus, Ohio, assignor, by
mesne assignments, to The Haloid Company,
Rochester, N. Y., a corporation of New York

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4 Claims. (Cl. 95-1.9)

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This invention relates to a method of removing electroscopic powder from an electrophotographic plate, with particular reference to cleaning residual powder from the plate after an electrostatic powder image has been transferred to a paper or other sheet, and has for its purpose to afford a quick, practical, and effective method for cleaning such plates in a manner that avoids rubbing, or applying an air blast to the surface of the photoconductive layer of the plate, so as not to scratch, mar, or injure the photoconductive layer, from the surface of which the electroscopic particles must be removed, and thus enabling frequent and repeated uses of the plate.

In carrying out the electrophotographic process, the plate is produced by coating a metal plate with a suitable photo-conductive insulating material such as anthracene, sulphur or the like, which becomes conductive when exposed to light, and when such coated plate is charged electrostatically and exposed to the subject being reproduced, a latent electrostatic image is formed on the photoconductive layer of the plate and developed by dusting with a suitable electroscopic powder, the powder image thus formed being subsequently transferred to a sheet of paper or other transfer material and affixed by any suitable fusing or other process, after which it becomes necessary to clean the electrophotographic plate and remove any residual powder in order to prepare it for another electrostatic charge and exposure.

It is desirable that such plates be used repeatedly many time for commercially practical operations, and efforts have been made to clean them by air blast and by wiping with a cloth, but these procedures have been found to possess serious objections, and it is a purpose of this invention to afford an improved method of cleaning such plates in a way that avoids the necessity of wiping with a cloth or of using air currents, and overcomes all of the difficulties incidental to prior methods.

Cleaning by air blast has not been sufficiently effective or practical, because it requires elaborate equipment for a commercial operation, and cloth wiping has not been successful since it frequently leaves a thin film of the electroscopic powder on the plate and a manual cloth-wiping operation does not lend itself to automatic or machine devices which are required for commercially practical operations.

The present invention avoids all of these objections and is carried out by employing electrical at-

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tractive means for removing the residual dusting powder from the plate.

Preferably this is accomplished by the use of a granular salt, preferably a cubic salt such as sodium chloride or ammonium chloride, although other materials or compounds may be employed as long as they function in the manner described below.

The developing material comprises a mixture of an electroscopic powder comprising a micronized pigmented resin or other suitable insulating material and a granular carrier consisting of particles of larger size than the electroscopic powder and having an electric charge opposite to that of the electroscopic powder, as set forth in co-pending application Ser. No. 762,005, filed July 18, 1947, and in carrying out the present invention, it has been found that the desired results are attained by using a granular salt such as forms a constituent part of the developing material and is mixed with an electroscopic powder for developing purposes.

After the electrophotographic plate has been dusted with the developing powder and the powder image transferred to a paper or other sheet, it is necessary to clean the plate and remove the residual electroscopic powder, and to effect this, a cleaning compound consisting preferably of the granular salt carrier referred to above is flowed over the plate and because of its electric charge being opposite to that of the electroscopic powder and also of larger size and greater weight than the electroscopic powder particles, the granular carrier particles attract the electroscopic powder particles away from the plate and remove them entirely along with the granular salt particles as the latter are flowed over the plate.

Any cubic salt or other granular material having an electric charge opposite to that of the electroscopic powder and with particles of larger size than the electroscopic powder particles can be used successfully, and as the granular salt particles move across the plate by tipping the latter or in any suitable fashion, they attract and pick up the electroscopic powder particles and by the combined action of electrical attraction and gravity remove them completely from the plate.

While the invention has been described with reference to a certain procedure and specific materials, it is not confined to the exact details herein disclosed, as for instance any means serving to attract the electroscopic powder particles away from the plate might be successfully employed, and this application is intended to cover such

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modifications or departures as may come within the scope of the following claims.

I claim:

1. The method of removing electroscopic powder from an electrophotographic plate which consists in flowing over the plate a granular material having an electric charge opposite to that of the electroscopic powder.

2. The method of removing electroscopic powder from an electrophotographic plate which consists in flowing over the plate a granular material consisting of particles of larger size than the electroscopic powder particles and having an electric charge opposite to that of the electroscopic powder.

3. The method of removing electroscopic powder from an electrophotographic plate which consists in flowing over the plate a granular salt ma-

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terial having an electric charge opposite to that of the electroscopic powder.

4. The method of removing electroscopic powder from an electrophotographic plate which consists in flowing over the plate a granular salt material consisting of particles of larger size than the electroscopic powder particles and having an electric charge opposite to that of the electroscopic powder.

HAROLD E. COPLEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,297,691	Carlson	Oct. 6, 1942