

1

3,394,653

NOVEL METHOD OF CLEANING PAPER PLANOGRAPHIC PLATES

Robert E. Riesberg, 126A Nassau Ave.,
Brooklyn, N.Y. 11222

No Drawing. Filed Oct. 12, 1965, Ser. No. 495,322
6 Claims. (Cl. 101-465)

ABSTRACT OF THE DISCLOSURE

Novel method of cleaning paper planographic plates which are used as stencils, plates, masters or mats for offset printing and duplicating, and to the novel cleaning compositions.

Prior art

Planographic plates are commercially available items for use with every type of business copying machine and are in the form of single flat sheets, continuous flat folded sheets, and in roll form. The said plates have a water-wettable surface coating which can receive an ink-receptive, water-repellent image. When the said plate or mat with the image thereon is to be used in an offset press, for example, the plate is dampened or "etched" with an aqueous etching solution of acids or acid salts with or without glycerine or glycols before the press run, and during the runs the plate is continually wetted with the etching solution by a dampening roll. The etching solution wets only the background or non-image area since the image is water-repellent, and as the wet plate passes over the ink roller a film of ink is deposited on the image only and not the wet background portion of the plate. The ink film is then transferred to a blanket roll which prints the final image on the finished paper copy.

The images can be formed on the planographic plates by a variety of ways, such as by typewriter with a special ribbon, or special pens or pencils, to form ink-receptive, water-repellent images, or by letterpress or by offset duplication to transfer the image from an existing plate. A rapidly growing method of forming the images is by the use of copying machines using the electrostatic process such as Xerox and Electrofax, since these machines can form images from a wide variety of sources.

The disadvantage of the planographic plates resides in the fact that the plates have to be handled carefully to avoid soiling the specially treated surface of the plates. The plates cannot be handled with soiled hands or fingerprints or other marks will be reproduced when the plate is used. Typewriter keys must be specially clean to remove any residue of common typewriter ribbon ink to avoid transferring it to the mat. Erasures must be made with special erasers that are free from oil and grease, which can contaminate the plate surface, and free from coarse abrasives which can damage the plate surface.

When the images on the plates are formed by an electrostatic process such as Xerox, images of the edges of copied pages may appear on the final plate. Also, if the material to be copied by the electrostatic process is smudged or soiled by use, these imperfections will appear on the final plate. For example, if an image is to be taken from a newspaper or magazine, any ink smudges or faint imperfections therein will be reproduced. If erasures have been made on the original, faint images or shadows will appear on the plate.

Various attempts have been made to remove these undesirable images from the plates after the image has been formed thereon. The only practical solution has been erasing the plates with the special erasers, but this is tedious and time-consuming, and frequently the plate surface is marred during this cleaning so that it cannot

2

be used. Furthermore, imperfections between printed lines or smudges on the paper cannot be corrected by this method.

Objects of the invention

It is an object of the invention to provide a novel method of chemically cleaning planographic plates before or after an image has been formed thereon.

It is another object of the invention to provide novel compositions for cleaning planographic plates.

These and other objects and advantages of the invention will become obvious from the following detailed description.

The invention

The method of the invention of cleaning planographic plates comprises applying to the surface of the plate an aqueous alkaline solution of a salt of a strong base and a weak acid having a pH of 7.1 to 12.5, preferably about 8.5 to 11.0, and after the imperfections have been removed, neutralizing the solution.

The aqueous alkaline solution preferably contains up to 5%, most preferably between 0.5 and 1.5%, of a wetting agent.

The said method removes all the smudges and imperfections discussed above, and portions of the plate or the entire plate may be cleaned in this manner. An unexpected of the method is the fact that not only is the plate cleaned when a wetting agent is present in the cleaning solution, but the image formed thereon before the treatment is sharpened or brightened so the printed image is darker and more clear.

The pH of the aqueous alkaline solution is critical. If the pH is greater than 12.5, the image will not be satisfactorily ink-receptive and the solution will tend to wet through the surface of the plate. If the pH is below 7.1, the solution will not remove the smudges and the imperfections from the plate. A preferred solution is an aqueous solution of 2 to 4% of trisodium phosphate and about 1% of a wetting agent.

The aqueous alkaline solution may be applied to the plate in any suitable fashion. For example, a cloth or cotton ball saturated with the solution may be wiped over the plate and then the excess solution may be wiped off after a few minutes. Also, the plate may be mounted in the copying machine for use, then wiped with the cleaning solution, and after the undesired smudges have been removed, the copying machine is started whereby the etching solution neutralizes the aqueous alkaline solution. If a small amount of the solution is used, it will be neutralized by the acid coating of the planographic plate. For particularly difficult spots, special erasers as described above may be dipped in the aqueous alkaline solution and gently rubbed.

Any alkaline salt of a strong base and a weak acid is suitable for forming the aqueous alkaline solution having the desired pH. Examples of suitable alkaline salts are alkali metal salts of phosphoric acid such as trisodium phosphate, tetrasodium phosphate, disodium hydrogen phosphate, sodium dihydrogen phosphate, tripotassium phosphate, sodium pyrophosphate, sodium tripolyphosphate, sodium hexametaphosphate, etc.; alkali metal carbonates such as sodium carbonate, potassium carbonate, etc.; alkali metal borates such as sodium borate, etc., alkali metal silicates such as sodium or potassium metasilicate, etc.

Any known wetting agent can be added to the aqueous alkaline solution to improve the cleaning ability thereof and to improve the image on the plate. Examples of suitable wetting agents are alkali metal salts of alkylaryl sulfonates such as sodium dodecyl benzene sulfonate, etc.; alkali metal salts of alkyl sulfonates having 12 to 20 carbon atoms; alkali metal salts of sulfated higher

fatty alcohols having 10 to 20 carbon atoms, such as sodium tetradecyl sulfates; sulfated oils such as Turkey-red oil, etc., nonionic surfactants such as isooctylphenyl polyethoxyethanol, etc.

In the following examples there are described several preferred embodiments to illustrate the invention. However, it should be understood that the invention is not intended to be limited to the specific embodiments.

EXAMPLE I

20 grams of trisodium phosphate and 10 grams of sodium dodecyl benzene sulfonate were dissolved in 970 grams of water to form a cleaning solution. A planographic plate had an image of a newspaper formed thereon by the Xerox process and the image had background shadows which were on the original newspaper.

The said plate with the image was wiped with a cloth saturated with the said 2% trisodium phosphate solution, and after setting for five minutes the plate was wiped dry with a clean dry cloth. The plate was clear of any smudges or imperfections and the image was sharper and gave a more clear, darker final copy than an identical plate not treated with the cleaning solution.

EXAMPLE II

40 grams of disodium hydrogen phosphate and 10 grams of sodium dodecyl benzene sulfonate were dissolved in 950 grams of water to form a cleaning solution having a pH of 9.5. Using the method of Example I, the said solution was used to clean a planographic plate having an image of a newspaper formed thereon with the same excellent results.

Additional examples of suitable solutions of the invention which have been successfully used to clean planographic plates with images formed thereon are 2½ parts of sodium pyrophosphate and ½ part of sodium dodecyl benzene sulfonate in 97 parts of water, 2 parts of trisodium phosphate and ½ part of isooctyl phenyl polyethoxyethanol in 97½ parts of water, 2 parts of trisodium phosphate and ½ parts of sodium tetradecyl sulfate in 97½ parts water, 2½ parts of tripotassium phosphate and ½ part of sodium dodecyl benzene sulfonate in 97 parts water, 4 parts of sodium metasilicate in 96 parts of water, 2 parts of sodium metasilicate and ½ part of sodium dodecyl benzene sulfonate in 97½ parts of water, 1 part of sodium metasilicate and ½ part of sodium dodecyl benzene sulfonate in 98½ parts of water, 2 parts of sodium hexametaphosphate and ½ part of

sodium dodecyl benzene sulfonate in 97½ parts of water, 3 parts of sodium tripolyphosphate and ½ part of sodium dodecyl benzene sulfonate in 96½ parts of water, 2½ parts of sodium tetrakisphosphate and ½ part of sodium dodecyl benzene sulfonate in 97 parts of water.

Various modifications of the method and compositions of the invention may be made without departing from the spirit or scope thereof, and it is to be understood that the invention is to be limited only as defined in the appended claims.

I claim:

1. A method of cleaning paper planographic plates which comprises applying to the image receiving surface of paper planographic plates an aqueous alkaline solution having a pH of 7.1 to 12.5 of 2 to 4% by weight of an alkali metal of a weak acid salt selected from the group consisting of phosphates, borates, carbonates and silicates and 0 to 5% by weight of a wetting agent and neutralizing the said solution after imperfections on the said surface have been removed.

2. The method of claim 1 wherein the aqueous solution contains 0.1 to 5% by weight of a wetting agent.

3. The method of claim 1 wherein the pH of the solution is 8.5 to 11.

4. The method of claim 1 wherein the salt is trisodium phosphate.

5. The method of claim 1 wherein the wetting agents is sodium dodecyl benzene sulfonate.

6. The method of claim 1 wherein the aqueous solution contains 0.5 to 5% of sodium dodecyl benzene sulfonate.

References Cited

UNITED STATES PATENTS

2,183,037	12/1939	Bavliiss et al.	252—138
2,376,096	5/1945	Snell	252—138
2,396,278	3/1946	Lind	252—138
2,441,653	5/1948	Van Dusen	101—149.2
2,471,645	5/1949	Morris et al.	252—138
2,794,388	6/1957	Lake et al.	252—138

OTHER REFERENCES

Reed-Formulas for Solutions used in Lithography No. 602, Litho. Techn. Foundation Inc. (1956) TR 925R4C2.

LEON D. ROSDOL, *Primary Examiner*.

W. E. SHULZ, *Assistant Examiner*.