Patented July 29, 1941 2,250,516

UNITED STATES PATENT OFFICE

2,250,516

TREATMENT OF PRINTING PLATES

William H. Wood, Bedford, Ohio, assignor to Harris-Seybold-Potter Company, Cleveland, Ohio, a corporation of Ohio

No Drawing. Application September 3, 1940, Serial No. 355,187

10 Claims. (Cl. 101—149)

In lithographic printing it is customary to treat the plates with gum arabic solution before printing, during printing, and as a protective coating during idle periods on the press and in storage. In preparing lithographic plates for the press it is the usual procedure to apply a "de-sensitizing etch" to the plate in the form of a solution comprising ammonium bichromate, phosphoric acid, and gum arabic, the latter in amount about 10 per cent by weight of the solution. Such solution is to render the non-printing areas particularly receptive to the moisture which is applied during printing, and correspondingly repellent to the greasy ink. While the plate is on the press it is usual to supply a dampening solution which is similar to the de-sensitizing solution but considerably less concentrated. When the plate is idle on the press or is removed from the press for storage, the usual procedure is to apply a solution of gum arabic in water, the dried gum acting as a protective coating. In the latter instance a small amount of a preservative such as mercury bichloride is added if the solution is to be kept more than a few days before use. While gum arabic thus employed has found wide acceptance and application, it has certain disadvantages and limitations which impair its usefulness. The commercial product is impure, containing foreign matter of various kinds which must be removed. It is also subject to variations in general quality and in availability and price. Gum arabic also dissolves quite slowly in water, thus necessitating that solutions be prepared well in advance of use. Further important from the standpoint of lithography is the fact that the known dampening solutions containing gum arabic must be applied in relatively large amounts during printing in order to maintain the non-printing areas clean and de-sensitized to ink. This results in a tendency to emulsification of the ink with the dampening solution, with attendant weakening of the printing, scumming of the plate and stripping of the ink from the ink rollers. The nature of this gum is such as to encourage this tendency. Gum arabic is also acidic in character, and as a result has some tendency to corrode printing plates which have been stored for sometime with a gum coating. In accordance with the present invention, printing plates may be treated particularly advantageously and with elimination of difficulties such as noted. The procedure also is especially convenient.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In accordance with the invention, I treat lithographic plates, which may be of usual or preferred materials, zinc, aluminum, etc., with a solution of arabogalactan of desired concentration and with or without the addition of other ingredients, depending upon the nature of the treatment and the results desired. Arabogalactan is compatible with various acids and neutral salts, thus making possible solutions of various compositions for various purposes. For example, as a "de-sensitizing etch" for rendering the non-printing areas of a plate repellent to ink before printing, I may employ a relatively concentrated solution of arabogalactan to which has been added a small amount of one or more of any of the de-sensitizing acids or salts, such as known for treating lithographic plates. These for instance may be acids or salts providing in solution a chromate ion, as chromic acid, or ammonium, sodium or potassium bichromate, etc., or they may be acids or salts providing in solution a phosphate ion, as phosphoric acid or ammonium, sodium or potassium phosphate, or they may be other acids or salts providing in solution another de-sensitizing acid ion. The concentration is not critical, it being only necessary that the solution be readily applied and that the etching effect be sufficient to produce the desired de-sensitizing result while not damaging the plate. Arabogalactan, to which the formula

$$(C_5H_8O_4.(C_6H_{10}O_5)_6)_2$$

is generally assigned, is, as commercially obtained a dry, white, light weight powder, one method of its manufacture being from wood waste. It dissolves in water much more quickly than gum arabic and forms clear colorless solutions. It is very highly soluble forming solutions of high concentration, and such solutions have notably lower viscosity than gum arabic solutions of similar concentration. Solutions of arabogalactan moreover are nearly neutral instead of somewhat acid as are solutions of gum arabic.

For use as a dampening solution during printing, I may employ the same type of solution as just described but diluted to appropriate strength for continued application to the plate. For application to the plate for protection during idle periods or storage I may use simply a water solu-

tion of easy-working concentration sufficient to form a continuous coating of dried arabogalactan on the plate, or I may add a small amount of a preservative such as mercury bichloride to the solution to improve its keeping quality.

As an example in de-sensitizing a plate before printing: Two solutions are made up, of which solution A comprises ammonium bichromate one ounce, and water 8 ounces, and solution B comprises phosphoric acid one-half ounce, and 20 per cent arabogalactan solution 8 ounces. One part of solution A is mixed with one part of solution B for application to the plate.

As an example for dampening during printing: One ounce of above solutions A and B are mixed with two gallons of water, and the solution is supplied to the water fount.

As an example of protective coating after printing: Arabogalactan, 20 parts by weight, is made up with water, 100 parts by weight. The plate to be protected is coated with this in the usual manner.

While thus concentrations of about 10 per cent arabogalactan and about 6 per cent soluble bichromate and about 3 per cent phosphoric acid are satisfactory for de-sensitizing, and arabogalactan around 0.1 per cent and about 0.09 per cent of the plate de-sensitizing acid ion are satisfactory for dampening, as above-noted the concentrations of the ingredients are not critical, and may be varied in any concentrations consistent with the mode of applying the solution and the results desired.

De-sensitizing the plate and dampening the same during printing with arabogalactan solutions results in notable improvements. In particular, there is a superior wetting property over gum arabic solutions, thus affording excellent adherence to the plate and easy and thorough flow over the surface thereof. Furthermore, notably less dampening fluid is required during printing, and consequently there is less tendency to emulsification and scumming and stripping. The arabogalactan solution has less inherent tendency to emulsify with the ink than is the case with the gum arabic solution. Applied as a protective coating during storage, the arabogalactan also has less tendency to corrode plates, owing to its neutral character.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In the treatment of lithographic printing plates bearing a printing image thereon, applying to the plates an aqueous solution containing arabogalactan.

2. In the treatment of lithographic printing plates bearing a printing image thereon, applying to the non-image areas of the plate an aqueous solution comprising arabogalactan and a substance providing in solution a plate de-sensitizing acid ion.

3. In the treatment of lithographic printing plates bearing a printing image thereon, applying to the non-image areas of the plate an aqueous solution comprising arabogalactan and a substance providing in solution a chormate ion.

4. In the treatment of lithographic printing plates bearing a printing image thereon, applying to the non-image areas of the plate an aqueous solution comprising arabogalactan and a substance providing a chromate ion and a substance providing a phosphate ion.

5. In the treatment of lithographic printing plates after formation of the printing image thereon, before printing applying to the non-image areas of the plate an aqueous solution containing about 10 per cent of arabogalactan and about 6 per cent of a soluble bichromate and about 3 per cent of phosphoric acid.

6. In the treatment of lithographic printing plates, during printing applying to the plate an aqueous solution containing about 0.1 per cent of arabogalactan and about 0.05 per cent of a substance providing a plate de-sensitizing acid radical.

7. In the treatment of lithographic printing plates bearing a printing image thereon, providing a thin coating of arabogalactan dried on the surface of the plate as a protection thereto.

8. A lithographic printing plate bearing a printing image thereon and having a thin coating of arabogalactan.

9. A lithographic plate treating agent comprising arabogalactan.

10. A lithographic plate treating solution comprising arabogalactan and a substance providing a plate de-sensitizing acid radical, and water.

WILLIAM H. WOOD.