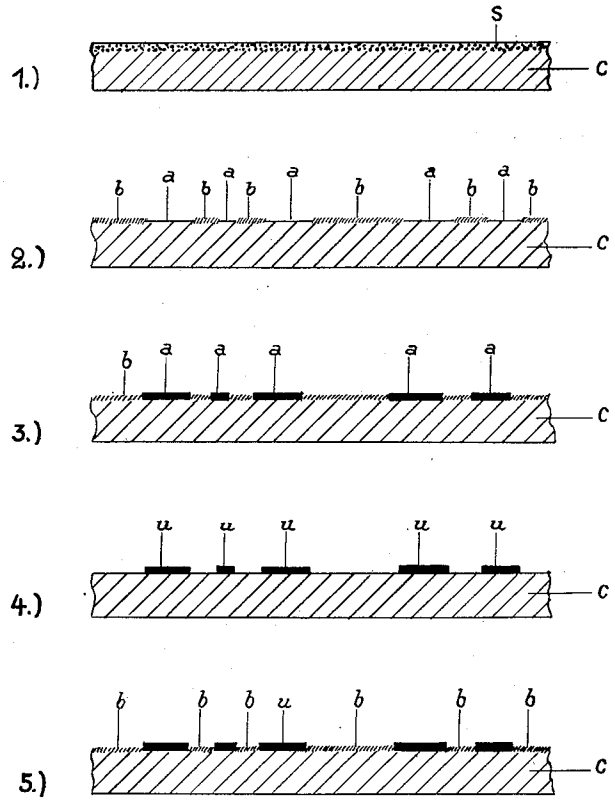
Jan. 16, 1934. U. OSTWALD 1,943,486

PLANOGRAPHIC PRINTING BASE AND PROCESS OF PREPARING IT

Filed March 10, 1931



INVENTOR:
Ulrich Ostwald,
BY
Byrnes, Townsend & Potter,
ATTORNEYS.

Patented Jan. 16, 1934 1,943,486

UNITED STATES PATENT OFFICE

1,943,486

PLANOGRAPHIC PRINTING BASE AND PROCESS OF PREPARING IT

Ulrich Ostwald, Wiesbaden-Biebrich, Germany, assignor to Kalle & Co. Aktiengesellschaft, Wiesbaden-Biebrich, Germany, a corporation of Germany

Application March 10, 1931, Serial No. 521,613, and in Germany March 14, 1930

11 Claims. (Cl. 95—5.4)

The present invention relates to planographic printing bases and a process of preparing them.

The known planographic printing processes depend upon the opposite behaviour of certain materials towards fatty substances, on the one hand, and water or aqueous solutions, on the other hand, the fatty ink being only retained in those parts of the printing plate which are not moistened with aqueous liquids. The known processes are: photographic printing, lithographic printing, zincography, printing on aluminium plates, the so-called pantome process (wherein the opposite behavior of fat and mercury is employed) etc.

In photographic printing processes the parts retaining the fatty inks are produced by tanning the gelatine. The non-tanned parts of the surface swell up in water or glycerine and repel the fatty ink. In zincography the parts of the zinc plate retaining the fatty inks are produced by treating them with fatty inks, so that they cannot be etched. The parts which do not print are formed by oxidation (etching) of the free surfaces. The oxide layer thus prepared is moistened with water and it does, therefore, not take up any fatty ink.

Now I have found that the same effect can also be attained with considerably simpler means by partially retransforming into cellulose, foils from suitable cellulose derivatives, such as acetyl cellulose or nitrocellulose by treating the parts which are not to print with saponifying agents. The said cellulose esters do not retain water, but do retain fatty inks. The cellulose hydrate which has been formed in the places which are treated with saponifying agents, however, swells up in water, glycerine and other swelling agents and, in this state, does not retain any fat colour. In this way there can be attained that, after the foil has been moistened, the fat colours are only retained by the parts which are not saponified and then serve as printing places.

The printing base is advantageously elastic, so that it can adapt to the unevenness of the paper to be printed. By addition of the usual elasticizing agents such as monoacetine, diacetine, tricresylphosphate, tributylphosphate, diethyl ester of phthalic acid, etc. to the cellulose derivative, it is possible to give the foils a sufficient elasticity. These foils are preferably arranged on elastic bases, such as rubber bases, which are protected against distortions by metal plates. The foil can be produced by sticking films on the base, or by applying the dissolved substances as varnish coating.

In order to guard the printing parts of the foil from saponification or etching, the caustic liquor is only applied in the parts to be etched. The printing parts of the foil can also be coated with suitable preservatives, for instance with asphalt, lithographic ink, lithographic chalk, etc. The designs or pictures can also be produced by reprinting. By coating the foils with the usual light-sensitive layers, such as chrome-albumine, and treating them as usual, by inking with a fatty ink and if required dusting on asphalt, in order to melt it as usual, the new process can also be utilized in a manner analogous to the preparation of zinc originals. The design is then produced by saponifying the free parts of the foils by means of alkali. This process can be compared with the etching by means of nitric acid usual in the preparation of zinc originals.

Furthermore I have found that those printing bases and lithographic printing blocks can also be obtained by exposing cellulose derivatives sensitized in their mass with suitable agents to light and then treating them with saponifying agents. The properties of those cellulose derivatives are largely altered by the exposure to light, so that they can only be saponified in the exposed parts with considerably more difficulty. The sensitization of the cellulose derivatives in the mass can be attained by adding the sensitizing agent (preferably a chromate) to the solution of the cellulose derivative and preparing a sheet or the like from this solution, or by causing the sensitizing agent, dissolved in a medium which has a swelling or dissolving action upon the cellulose derivative, to act upon the sheet or the like formed from this cellulose derivative.

The accompanying drawing illustrates the invention.

Fig. 1 shows a film C containing the light-sensitive layer S. Fig. 2 is the same film after exposure and saponification, *a* are the places met by the light and, therefore, not saponified, *b* the unexposed parts being saponified. Fig. 3 shows the film of Fig. 2, after the inking with a fatty ink, only the unsaponified places *a* have retained the fatty ink. Fig. 4 shows a printing place C with a printing design U covered by a protective layer, Fig. 5 shows the same plate after saponification, only the places *b* not covered by the protective layer are saponified.

The following examples serve to illustrate the invention, but they are not intended to limit it thereto.

(1) Plates of acetyl cellulose are provided with

reprints or transfers in the usual way and then dipped for 60 seconds into a caustic soda solution of 10% strength (specific gravity=1.4) and thereupon well washed. After washing the plate is ready for printing and may, when sufficiently moistened, be inked with a fatty ink.

(2) Plates of acetyl cellulose are coated with a solution of 240 cc. of water, 30 cc. of albumin, 1.3 grams of ammonium bichromate, 8 grams of dilute ammonia solution. After drying they are exposed under a half-tone negative, inked with fatty inks and developed in the water bath by means of a wad. By dusting asphalt upon them and melting the dust, the fatty ink can better be protceted against the action of the lye. By treating with the said caustic soda solution, the free parts are saponified.

(3) A foil of acetyl cellulose is sensitized by repeatedly soaking with a saturated solution of ammonium bichromate in methyl alcohol. After the layer has dried, it can be exposed under a negative, for instance to the light of a 15 ampere arc lamp for 5–10 minutes. It is then placed in strong caustic soda solution and afterwards washed. Now the foils are ready for printing. Since the exposed parts are not saponified, they retain the fatty ink, whereas the unexposed parts of the foil are moistened with water and, therefore, repel the fatty ink.

I claim:

1. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of cellulose esters capable of being saponified, producing the desired printing design being resistant to a saponifying agent upon that base and causing a saponifying agent to act upon the places of the printing base which are free from the printing design.

2. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of cellulose esters capable of being saponified and containing a light-sensitive product in the mass, producing the desired printing design being resistant to a saponifying agent upon that base by exposing it to light under a pattern and causing a saponifying agent to act upon the places of the printing base which are free from the printing design.

3. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of cellulose esters containing a light-sensitive product in the mass, producing the desired printing design being resistant to a saponifying agent upon that base by exposing it to light under a pattern and causing a saponifying agent to act upon the places of the printing base which are free from the printing design.

4. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of cellulose ester capable of being saponified, producing the desired printing design upon that base, covering the places containing the printing design with a protective layer and causing a saponifying agent to act upon the places of the printing base which are free from the printing design.

5. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of acetyl cellulose, producing the desired printing design being resistant to a saponifying agent upon that base and causing a caustic soda solution of 10% strength to act upon the places of the printing base which are free from the printing design.

6. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of acetyl cellulose containing a light-sensitive product in the mass, producing the desired printing design being resistant to a saponifying agent upon that base by exposing it to light under a pattern and causing a caustic soda solution of 10% strength to act upon the places of the printing base which are free from the printing design.

7. In the process of preparing planographic printing bases, the step which consists in using as printing bases sheets of acetyl cellulose, producing the desired printing design upon that base, covering the places containing the printing design with a protective layer and causing a caustic soda solution of 10 per cent. strength to act upon the places of the printing base which are free from the printing design.

8. A planographic printing plate consisting of a cellulose ester and having a printing surface of which the ink receptive, image portion consists of the cellulose ester, and the water receptive, non-image portion consists of cellulose hydrate.

9. A planographic printing plate consisting of acetyl cellulose and having a printing surface of which the ink receptive, image portion consists of acetyl cellulose, and the water receptive, non-image portion consists of cellulose hydrate.

10. A planographic printing plate consisting of a cellulose ester and having a printing surface of which the ink receptive, image portion consists of the cellulose ester in combination with a gelatin layer, and the water receptive, non-image portion consists of cellulose hydrate.

11. A planographic printing plate consisting of acetyl cellulose and having a printing surface of which the ink receptive, image portion consists of acetyl cellulose in combination with a gelatin layer, and the water receptive, non-image portion consists of cellulose hydrate.

ULRICH OSTWALD.