

UNITED STATES PATENT OFFICE.

WALTER B. WOODBURY, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

METHOD OF PRODUCING FLEXIBLE SUPPORTS FOR PHOTOGRAPHIC RELIEFS.

SPECIFICATION forming part of Letters Patent No. 263,277, dated August 22, 1882.

Application filed May 31, 1881. Renewed April 5, 1882. (No specimens.) Patented in England July 22, 1878, No. 2,912; in France January 20, 1879, No. 128,544, and in Belgium January 27, 1879, No. 47,245.

To all whom it may concern:

Be it known that I, WALTER BENTLEY WOODBURY, of London, in the county of Middlesex, England, have invented certain Improvements in the Method of Producing Flexible Supports for Photographic Reliefs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My present invention relates to the method of producing designs upon paper by pressure from reliefs obtained by means of photography, as patented by me in the United States of America, April 28, 1868, No. 77,230.

My present invention has for its objects improvements in the method of preparing the relief-surfaces used in impressing the designs or pictures upon paper, so that they are more readily used and of great durability, and also in the method of so impressing the pictures or designs.

My improvements are also applicable to the production of pictures or designs upon cloth or other fibrous or soft materials, as well as upon paper.

In order to prepare the gelatine relief by which designs are impressed upon paper, as described in my former invention, a sheet of paper is coated with a solution in water of gelatine or gelatinous material; and in order to render the gelatine less transparent when dry a small quantity of any opaque pigment—such as india-ink—is added to the solution, and by adjusting the proportion of such pigment a greater or less amount of relief can be obtained, as desired, in the surface when finished, as hereinafter described. The sheet of gelatinous tissue thus prepared is dried and may be kept until required, and it is then rendered sensitive to light by floating it upon, treating its surface with, or immersing it in a solution of bichromate of potash or ammonia in the usual well-known way. The sheet thus sensitized is then dried and is exposed to light under a transparent negative or positive picture of the required design, which is thus reproduced upon the sheet, the parts of which become more or less insoluble in proportion to the extent to which they have been affected by the light passing through the transparent picture. The gelatinous sheet is then fixed upon the surface of a plate of zinc or other metal,

but preferably steel coated with nickel. When the face of the gelatine sheet or film has been thus fixed upon the plate the paper support upon which it was formed is carefully washed away, as well as those parts of the gelatine which, not having been affected by light, remain soluble in warm water, and the remaining gelatine is dried and hardened by immersing it in alcohol. The design or picture is then visible in sufficient relief upon the surface of the gelatine, and can be used to transfer, by powerful compression, the design upon it to paper, cloth, or other fibrous material.

My present invention consists, first, of novel methods of preparing flexible supports instead of metallic plates for the gelatine relief prepared as described. For this purpose I take a sheet of paper of even texture, and I coat it with a solution consisting of water containing about ten per cent. of gelatine. When this coating is dry I place it in a solution of chrome alum of sufficient strength to render the gelatine insoluble. The sheet is then again dried, and its reverse side is floated upon a solution of shellac dissolved in water by the aid of borax. The proportion of these ingredients may be varied; but I prefer to use about sixty parts, by weight, of white lac and twelve parts of borax dissolved by boiling in three hundred parts of water. The sheet of paper thus prepared is rolled under great pressure, and becomes exceedingly hard, tough, smooth, and durable, in which state I use it, instead of the metal plate first described, to receive the gelatinous relief, the design upon which is much more durable and more easily reproduced upon the paper or cloth than when a metallic plate is used. I attach the gelatine sheet, from which the paper backing and the soluble gelatine are to be washed away, to the surface of the flexible sheets, prepared in either of the ways just described, by pressing the surface of the gelatine, which has been exposed to light under the transparent picture, into close contact with that of the flexible support while both are immersed under water, the surface of the flexible support having been first coated with a thin film of collodion. The surface of the sheet of paper, cloth, or other fibrous or soft material is placed upon the gelatinous relief supported as described, and the design

upon the latter is impressed upon it by the pressure of a sufficiently powerful rolling-press; but in order to prevent the dragging action upon the gelatine relief when attached to the flexible supports described, which takes place if the latter is passed, together with the sheet of paper or cloth, directly between rollers, I place them between the smooth thin steel plates, which are then passed through the rollers. In this way, and by the improved methods of preparing and supporting the gelatinous-relief surface, a much larger number of perfect impressions can be produced upon the paper or cloth than has heretofore been possible without injury to the gelatinous relief. By proportioning the quantity of opaque pigment in the gelatine relief, by which the latter is rendered more or less permeable to light, to the character of the paper, cloth, or other material upon which the designs are ultimately to be impressed, according to which character—such as thickness and hardness—greater or less compression by the projecting parts of the relief is requisite, perfect results are obtained in the impressions, combined with great durability in the gelatine relief. The character of the gelatine relief is thus readily modified by varying the quantity of the opaque

pigment so as to suit the particular picture or subject which is to be produced and the particular character of the paper or other material on which they are to be impressed. 30

As the pigment used needs to be opaque to actinic light only, it is obvious that a transparent material, if red or sufficiently non-actinic, may be used. 35

I do not claim the production of transparent designs or water-marks upon paper from reliefs or intaglios obtained by the aid of photography; but 40

I claim—

The method of preparing flexible supports of paper for photographic reliefs or intaglios, which consists in coating the paper sheet with a solution of gelatine dried and rendered insoluble by chrome alum, and then floated on its reverse side upon a solution of shellac dissolved in water by the aid of borax, substantially as described. 45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 50

WALTER B. WOODBURY.

Witnesses:

EDMUND EDWARDS,
ARTHUR E. EDWARDS.