

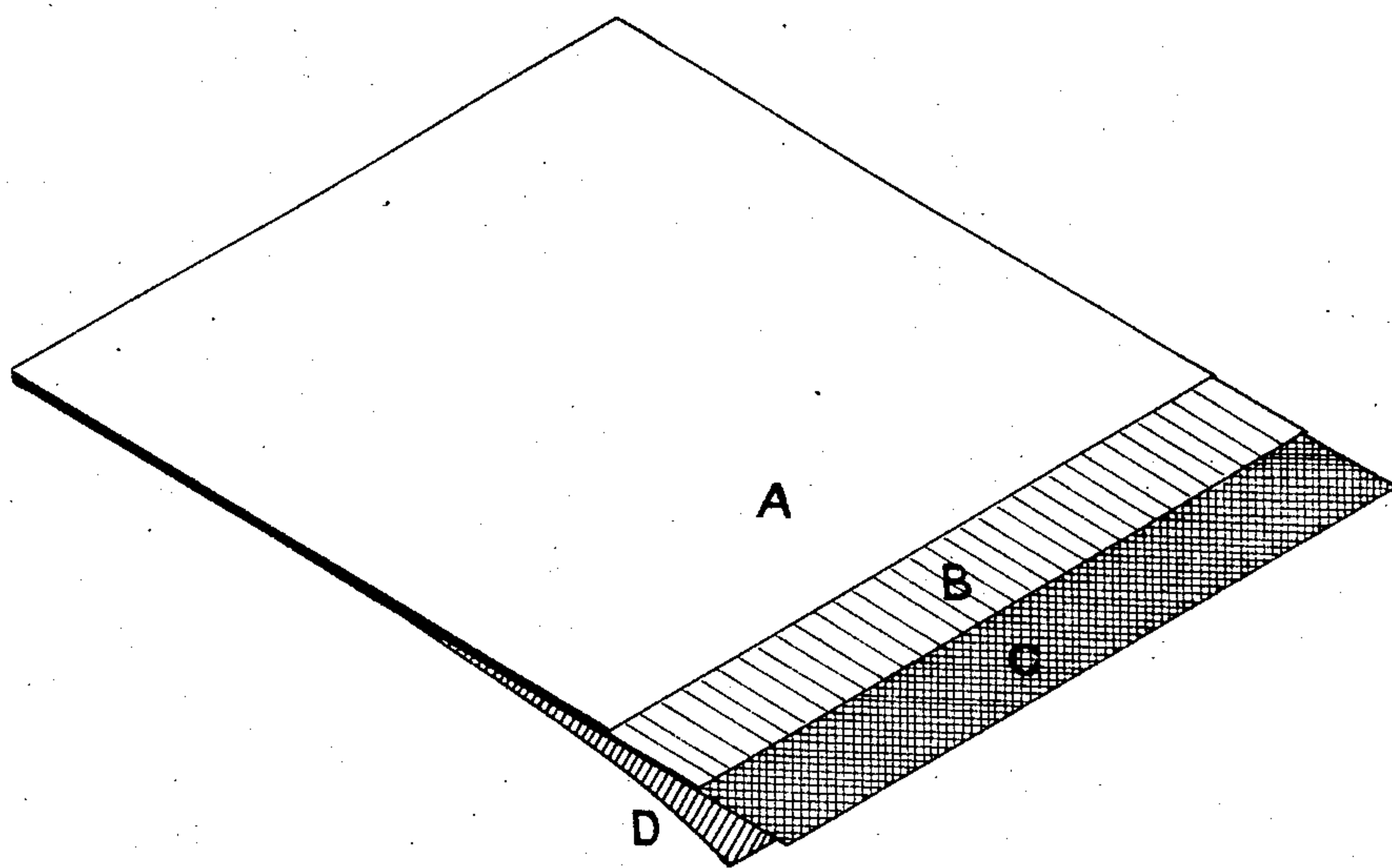
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J. E. THORNTON & C. F. S. ROTHWELL.

SELF DEVELOPING SENSITIVE PAPER.

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WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## SELF-DEVELOPING SENSITIVE PAPER.

SPECIFICATION forming part of Letters Patent No. 786,536, dated April 4, 1905.

Application filed March 20, 1900. Serial No. 9,465.

*To all whom it may concern:*

Be it known that we, JOHN EDWARD THORNTON and CHARLES FREDERICK SEYMOUR ROTHWELL, British subjects, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Self-Developing Sensitive Papers, of which the following is a specification.

In the art or process of producing photographic prints from negatives upon prepared paper by exposing the paper to light under the negative it has hitherto been the universal practice to develop and fix the image in two separately-prepared solutions in the case of some papers, while with other papers it has been necessary to tone and fix the image either in separate solutions or in a single solution prepared from the combined chemicals. These operations have always been troublesome and often uncertain, especially with amateur photographers, on account of the necessity for carefully mixing the chemicals and preparing the solutions and also the necessity for exercising care in the quantities of each ingredient used for each print, while the quantity of solution wasted through excess or because of its going bad from keeping often costs more than the quantity actually used.

The object of this invention is to dispense with bottles of chemical solutions and with all the weighing out and mixing of chemicals and with the waste now incurred and to provide printing-papers, cardboard, and other suitable materials upon which prints can be readily finished off after printing.

The drawing is a sectional view showing the several layers of material coated on the sensitive paper.

The invention has no reference to sensitive plates or films for use in the camera nor to the pictures produced thereon, which are termed "negatives."

The invention consists, essentially, in coating the back of the printing-paper with a concentrated solution of the necessary chemicals to produce when dissolved in water a developing and fixing solution.

In carrying out the invention we prepare a concentrated solution of the developing and fixing medium with a soluble cement or adhesive—such as gum, starch, dextrine, sugar, or the like—which can be easily applied to the surface of the paper, will dry or set hard thereon, and be readily dissolved again when immersed in water. We prefer to prepare the medium as a combined developer and fixer; but it may be prepared and applied as a developer only to certain classes of paper, or it may be prepared as a combined toner and fixer or as a fixing medium only, according to the class of sensitive paper to which it is to be applied.

The following may be taken as examples of suitable preparation:

*Developer only.*—Metol, two grains; hydroquinone, two grains; sodium carbonate anhydrous, ten grains; sodium sulfite anhydrous, ten grains; potassium bromid, one-half grain.

*Developer and fixer combined.*—Sodium sulfite anhydrous, fifteen grains; sodium hydrate, powdered, nine grains; sodium thiosulfate anhydrous, twenty grains; kachin or pyrocatechin, nine grains.

*Fixer only.*—Sodium thiosulfate.

These materials are made into a strong solution with sugar or dextrine and applied to the paper, the concentration of the solution being regulated according to the amount required on the paper.

The back of the printing-paper is rendered more or less waterproof by a coating of an impervious material before the solution of the chemical medium is applied in order to prevent any penetration through the paper of the chemical medium, which would damage the sensitive coating on the face. Celluloid or other waterproof varnish or other suitable material may be employed for this purpose; but we prefer the product obtained by treating or dissolving the zinc or aluminium salts of the fatty or resin acids (or a mixture of these salts) with a suitable volatile solvent—such as benzene, coal-tar naphtha, benzolin, or other similar like hydrocarbon—and drying or solidi-



5 fying the same in the presence of heated air.  
 Upon the back of the sensitive paper A is first  
 spread the waterproofing material B, then it  
 is coated with the chemical medium C, and  
 10 finally dried. The layer of chemical medium  
 C may be protected by a sealing sheet or coat-  
 ing of air-tight material D, solubly attached  
 thereto—such as paper, soluble gelatin, or  
 15 other suitable material—thus inclosing the  
 chemical medium between the paper and the  
 air-tight covering, which will prevent the ac-  
 tion of the air upon the developing medium  
 and will prevent it coming into contact with  
 and damaging the adjacent sheet of printing-  
 20 paper.

For development-papers—such as gelatino-  
 silver bromid, gelatino-silver chlorid, and the  
 like—we may use a developer only; but we  
 prefer to use a combined developer and fixer.  
 25 For print-out papers—such as gelatino chlo-  
 rid, collodio chlorid, and the like—we may  
 use a combined toner and fixer, or if the ton-  
 ing chemical is incorporated with the sensi-  
 tized coating, as is possible and sometimes  
 30 done, we simply apply the fixing chemical to  
 the back of the paper.

In use after the prepared sensitive paper  
 has been printed in the ordinary way it is  
 immersed in water and kept in motion therein  
 35 until the chemical medium attached to the  
 back completely dissolves. The solution thus  
 produced develops, fixes, and completes the  
 print, the paper being allowed to remain in  
 the solution any desired length of time. It is  
 subsequently well washed in running water to  
 remove all trace of the chemical medium and  
 dried in the usual way.

What we claim as our invention, and desire to protect by Letters Patent, is—

1. In a sensitive photographic paper for the 40  
 production of prints from negatives, the com-  
 bination with the paper base, the sensitive  
 layer on one side thereof, and developing, fix-  
 ing or toning chemical medium in a dry form  
 upon the other side thereof, of a layer of wa- 45  
 terproofing material interposed between the  
 sensitive medium and the chemical medium,  
 substantially as and for the purpose described.

2. In a sensitive photographic paper for the 50  
 production of prints from negatives, the com-  
 bination with the sensitive paper of a layer of  
 waterproofing material, spread upon the back  
 to isolate the chemical medium from the pa-  
 per and a layer of a chemical medium for de-  
 veloping, fixing or toning in a dry form spread 55  
 upon the waterproofing material, substantially  
 as and for the purpose described.

3. In a sensitive photographic paper for the  
 production of prints from negatives, the com-  
 bination with the sensitive paper, of a layer of 60  
 waterproofing material, a chemical medium  
 for developing, fixing or toning in a dry form  
 spread upon the back, and an air-tight cover-  
 ing solubly attached, to cover and protect the  
 same substantially as described. 65

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

J. E. THORNTON.  
 C. F. S. ROTHWELL.

Witnesses:

J. OWDEN O'BRIEN,  
 HARRY BARNFATHER.