

# United States Patent Office.

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## IMPROVEMENT IN THE MANUFACTURE OF PHOTOGRAPHIC PICTURES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, the undersigned, JOHN ROBERT JOHNSON, of No. 5 Haymarket, London, a director of the Autotype Printing and Publishing Company, limited, have invented Improvements in the Manufacture or Production of Photographic Pictures; and I do hereby declare that the following is a description of my invention, sufficient to enable those skilled in the art to practise it.

My invention relates exclusively to that class of photographic picture in which the images are produced by a pigment mixed with gelatine, and its analogues, and a bichromate. The gelatine, becoming insoluble under the joint action of light and the chromic salt, imprisons the pigment forming the images, which are revealed when the compound is placed in warm water. The pigment compound unacted upon, washes away, and the picture formed of the compound rendered insoluble remains. This operation is called the "development" of the picture.

Poitevin was the first to attempt to form such pictures. He spread the sensitive pigment compound upon paper, and printed through a negative thereon, washing away, subsequently, the compound unacted upon; but as much of this was below the images formed on the surface, the latter were removed with the soluble substratum.

Poucey succeeded better by brushing the same sensitive compound into the substance of a porous paper, which held the images, notwithstanding the soluble matter below them.

Burnet and Blair printed the sensitive compound from behind, washing away the soluble matter in front of or above the insoluble picture.

Fargier spread the sensitive compound upon glass or other plane, impermeable surface printed thereon, and then covered the picture with a layer of collodion. When the whole was plunged into water, the collodion floated with the insoluble picture attached thereto. When this was sufficiently developed, the film was caught upon a piece of gelatinized paper, which formed its permanent support.

Swan formed a "tissue" of collodion and gelatine, printed upon the collodion side, and then attached that side to a permanent support of paper, glass, earthenware, &c., by means of albumen, rendered insoluble by alcohol or heat, or by means of starch-paste. The pictures so produced were, however, reversed. To produce them non-reversed, he mounted the tissue, printed side downward, upon paper coated with India rubber, by means of a powerful press developed the picture upon this temporary support, and when dry attached the picture to a piece of paper by means of gelatine, &c. He then applied benzole to the India-rubber paper, which enabled the operator to strip off

that paper, leaving the picture attached permanently to the gelatine paper, the images being then in their correct position. Swan also used as a tissue the pigment spread upon paper like Poitevin. Edwards substituted gelatine, rendered partly insoluble by alum, &c., for albumen, rendered insoluble for the purpose of receiving the picture during development and forming the permanent support.

My invention consists in the use of shellac or other resinous body, dissolved in very weak ammonia, instead of the albumen, starch, or gelatine rendered insoluble, employed as above for permanently receiving and mounting the picture on its permanent support. The resin is unaffected by moisture, and does not turn yellow by age, and is therefore very superior to the substances heretofore used for this purpose.

I operate in the following manner:

I coat paper or any other plane surface, permeable or impermeable, with the sensitive pigment compound. When dry, I print upon this, and I immerse the printed sheet in water for a few seconds, until the gelatine has absorbed a portion only of the water which it will take up. I apply the wet sheet, face downward, upon the permanent support, (under water, if possible,) and with a flat brush or smooth straight edge, I scrape off the surplus water, and with it the air-bubbles. I then place the whole in a horizontal position for ten minutes or more, until the gelatine has absorbed the whole of the water remaining. The two surfaces will now be found to adhere, and I then plunge them into warm water, say at 100° Fahrenheit, until the picture be developed. I finally wash in cold water, and dry.

Any impermeable flat surface may be used, as glass, metal, japan-ware, varnished panel, painted cloth, waxed or oiled paper, prepared canvas-paper, coated with India rubber, or other substance impermeable to air and water, &c.

If glass or other transparent medium has been used as the support, the picture is non-reversed, when viewed through the glass, but in all other cases it is reversed.

If the support be impermeable to air and water, no preparation is necessary to enable it to receive the picture. If it be opaque, like paper, I coat it, previously to the application of the picture, with solution shellac in ammonia. When the volatile ammonia has evaporated, the resin is left in an insoluble state, but still moist and adhesive, and highly favorable to the reception of the gelatine film.

When the picture contains large white spaces and much delicate half tone, I give, as an extra precaution, a thin layer of the resin to the permanent supports, even when these are impermeable.

When it is desired to obtain pictures upon paper or other opaque surface in their correct or non-reversed



position, I use an impermeable surface, such as glass or metal plates, as a temporary support, having previously given them a thin smear or coating of some solid, fatty body. I prefer for this purpose a compound of beeswax and yellow resin, in the proportion of three of the former to one of the latter.

I find, also, that a film of India rubber or of gutta-percha, if of a moderate thickness, obtained by pouring on the glass or other plate a solution of these substances in a volatile solvent, will effect the like result, inasmuch as these substances have less adhesion to a polished surface than the film to the paper to which it is cemented. The India rubber, &c., therefore comes away from the plate attached to the picture, from which it is easily removed by friction.

It will be observed that the India rubber, &c., is used, not as a cementing substance, to effect adhesion, but as a means of separation, and such use differs greatly from that of Swan.

The surface, thus prepared, is then treated as already described. When the picture is dry, it is mounted upon paper, to which it is cemented by the

solution of shellac, and when again dry it peels readily from the waxed plate, particularly if the latter be heated or has been dried in a warm stove.

Having now described the nature of my invention, and the mode of carrying it out, I would state that I claim—

1. The use of shellac and its analogues, used in the way described, for the purpose of receiving and mounting the pigment picture-film upon its permanent support.

2. The mode of mounting and developing the pigment picture-film upon a temporary support, by means of the intervening surface of a solid, fatty, or resinous body, infusible at the temperature of development, and retaining the picture during that process, but which allows of the removal of the picture when cemented to its permanent support.

London, 20th March, 1869.

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Witnesses:

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