

# UNITED STATES PATENT OFFICE.

ALBERT LE ROY, OF PARIS, FRANCE, ASSIGNOR TO THE LA COMPAGNIE  
FRANÇAISE DU CELLULOID, OF SAME PLACE.

## PROCESS OF PRODUCING DESIGNS UPON CELLULOID.

SPECIFICATION forming part of Letters Patent No. 370,546, dated September 27, 1887.

Application filed September 14, 1886. Serial No. 213,503. (No specimens.) Patented in France July 20, 1886, No. 177,524; in Belgium August 3, 1886, No. 74,802; in Italy September 30, 1886; in Austria-Hungary November 4, 1886, and in Spain November 13, 1886.

*To all whom it may concern:*

Be it known that I, ALBERT LE ROY, of Paris, France, have invented a new and useful Improved Process of Coloring or Producing Colored Designs upon Celluloid and Analogous Products, (for which I have received Letters Patent in France, No. 177,524, dated July 20, 1886; in Belgium, No. 74,802, dated August 3, 1886; in Italy, dated September 30, 1886; in Austria-Hungary, dated November 4, 1886, and in Spain, dated November 13, 1886,) of which the following is a full, clear, and exact description.

This invention relates to a process of coloring or producing colored designs upon celluloid and other analogous products, whereby the dye or coloring-matter is caused to penetrate and become fixed in the surface of the celluloid or material treated in a fast and permanent manner, so as to resist the action of friction, washing, and other similar destructive influences.

By "analogous product" is here meant any plastic substance having a base of nitro-cellulose, such as those known in commerce under the names of "celluloid," "fibro-lithoid," "lithoxyl," "xylonite ivory," "pyroxiline," &c.

By this new process celluloid and analogous products are rendered available for the manufacture of many articles which could not heretofore be made thereof in consequence of the impossibility of imparting thereto a fast and wear-resisting decorative effect. For instance, imitation-linen goods—such as collars, cuffs, false shirt-fronts, and the like—have heretofore only been made of white color, because it was impossible to produce with celluloid goods in durable and wear-resisting colors in imitation of colored or fancy linen, whereas by the process of this invention an imitation colored linen may be produced from celluloid, imitating in the most perfect manner genuine colored linen and possessing absolute permanency of color, being far superior in this respect to the genuine colored fabrics used for shirting, which lose color every time they are washed.

The process of this invention is not limited to imitation-linen goods of celluloid, but is also applicable to fancy goods now largely made of that material. This new process of coloring

or producing colored designs upon celluloid is based, essentially, on the simultaneous action of the three following agents—namely, heat, pressure, and steam. A vehicle or intermediate material is used for receiving the color or colored design and transferring it to the celluloid under the influence of the agents above mentioned. This intermediate transferring agent may be paper, card, fabric, metal, or other animal, vegetable, or mineral substance.

Having described the nature of the process, I will now describe the practical method of carrying it into effect.

If it be desired, for example, to impart the appearance of colored or fancy linen to a collar or other article made of celluloid in imitation of white linen, (such article being generally made of a thickness of white linen inclosed between two layers of white celluloid,) the article, or one of the sheets or layers of celluloid of which it is to be composed is spread upon the bed of a press, and upon the surface to be colored is applied the transferring-vehicle previously colored or imprinted with the color or design to be produced upon the celluloid. This transfer-sheet being moistened is subjected to pressure, and while under pressure heat is applied by forcing steam into the hollow plates of the press or otherwise. Under the influence of the pressure the heat and the steam generated by the moisture of the transfer or intermediate fabric the colors are caused to completely penetrate the surface of the celluloid and become permanently fixed therein in such manner as to resist the friction and repeated washings to which such articles of celluloid are usually subjected. Similarly, if it be desired to produce a cravat of celluloid in imitation of a diapered and figured fabric, a piece of the real fabric to be imitated is used as the intermediate or transfer fabric, and is applied upon the celluloid surface in the manner above described, whereby both the colored design and a counterpart of the surface of the fabric to be imitated are produced upon the surface of the celluloid, thereby producing a perfect imitation.

In the case of fancy goods of celluloid the fabric of which a screen or fan is made may be imitated in a similar manner. To produce an



imitation of a painting upon ivory or mother-of-pearl, the artistic subject is printed by chromo-lithography upon a transfer plate or sheet of metal, paper, or other smooth-surfaced material, which is then applied upon the surface of a sheet of celluloid, (made or tinted in imitation of ivory or mother-of-pearl, as the case may be,) the surfaces in contact being moistened. The whole is then subjected to heat and pressure, whereby the artistic composition becomes transferred to and indelibly fixed in the celluloid. The article may then be polished, &c., without injuring the picture.

It will thus be seen that the invention consists in a process of color-printing upon celluloid or other analogous material, differing from ordinary existing processes in that, on the one hand, the color is applied upon an intermediate surface for the purpose of being transferred to the celluloid, and, on the other hand, the transfer into the celluloid of the colors printed on the intermediate surface is effected by the conjoint action of pressure, heat, and steam. Such process is distinct from those in use for coloring celluloid, which is effected by either incorporating the coloring-matter in the celluloid while in course of manufacture, or by im-

mersing the celluloid in an alcoholic solution or dye, in order to obtain stable colors, or by painting or printing the color by known means, which give unstable results easily destroyed by the least friction.

Having now particularly described and ascertained the nature of the invention and in what manner the same is to be performed, I declare that what I claim is—

The herein-described process of coloring or producing colored designs upon celluloid and analogous products, which consists in first printing the color or design upon any suitable material, and then damping and applying it with its printed side downward upon the celluloid sheet and subjecting both to pressure between hollow steam-heated plates, whereby the color or design becomes transferred to the celluloid and fixed in a permanent and indelible manner under the simultaneous influence of heat, pressure, and steam, as specified.

The above specification of my invention signed by me this 24th day of August, 1886.

ALBERT LE ROY.

Witnesses:

L. REMIRAND,  
J. DEBOIS.