

J. & B. GALAY.  
 PROCESS OF APPLYING COATINGS OF METAL AND COLLODION TO PAPER, GLASS, AND OTHER  
 MATERIALS.

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1,011,181.

Fig. 1

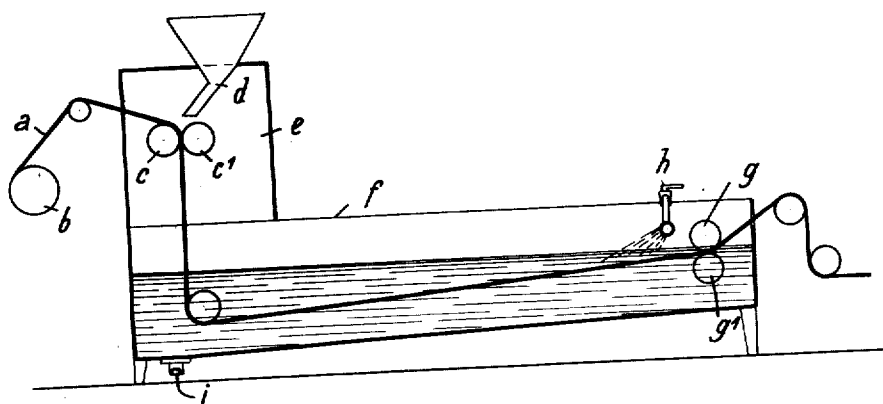
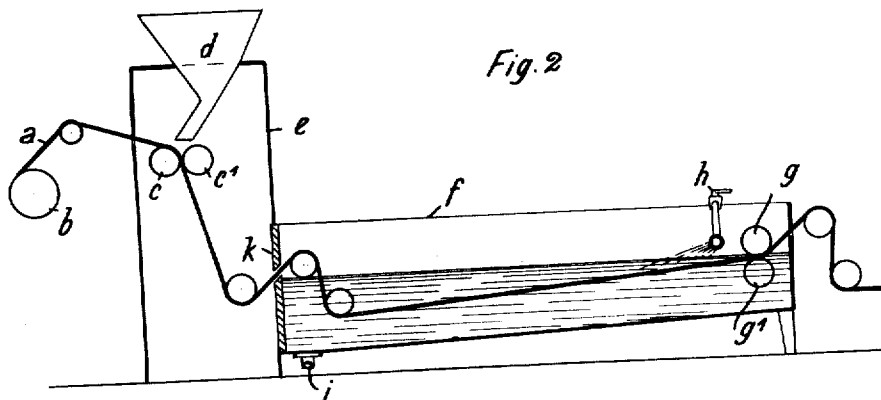


Fig. 2



WITNESSES

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# UNITED STATES PATENT OFFICE.

JACOB GALAY AND BORIS GALAY, OF MOSCOW, RUSSIA.  
PROCESS OF APPLYING COATINGS OF METAL AND COLLODION TO PAPER, GLASS, AND  
OTHER MATERIALS.

1,011,181.

Specification of Letters Patent.

Patented Dec. 12, 1911.

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*To all whom it may concern:*

Be it known that we, JACOB GALAY and BORIS GALAY, subjects of the Emperor of Russia, residing at Moscow, in Russia, have invented certain new and useful Improvements in the Process of Applying Coatings of Metal and Collodion to Paper, Glass, and other Materials, of which the following is a specification.

Solutions of nitro-cellulose (collodion) are frequently used for making protective, impermeable but elastic coatings for paper, glass and the like, oil or the like being added, according to the particular purpose for which the coating is used. The solvent is volatilized for the purpose of producing such coatings or films, and this renders the process of manufacture comparatively expensive. Moreover, the drying of the coating is comparatively slow, so that it is difficult to carry out the manufacture in a rapid, continuous manner. Owing to these drawbacks the use of collodion mixtures on a large industrial scale, for example, in the process of "metallizing" is impossible.

The object of the present invention is to remove these disadvantages, more particularly in regard to the metallizing of paper and the manufacture of photographic films, and to enable the solvent to be recovered for repeated use.

The mixture used in the improved process for the production of metallized materials consists of approximately 100 parts of collodion, 3 parts of powdered metal, and 2 or 3% of glycerin or oil such as castor oil, mineral oil or similar oils; if desired anilin dye soluble in alcohol, but not in water, may be added. This mixture is applied to the material to be coated, for example, to rough paper wound off a roller, the application taking place in a closed chamber, which the paper enters through a narrow slot.

The mixture may be applied by means of rollers which dip into a vessel containing the same, inside the chamber. If smooth, moist paper is used, such as is more particularly suitable for the manufacture of films, and from which a collodion layer can be easily detached when dry, the collodion is preferably applied by pouring it into the chamber through a slot past which the paper travels. The coated paper or other material passes through a slot into a long, flat vessel containing water, with or without rollers. The

material can ascend to, and pass through the vessel at an angle so that the excess of mixture flows off in a uniform manner. The steeper the direction imparted to the material and the slower its speed, the greater becomes the tenuity of the coating. While the material is moving through this vessel a stream of water flows through in the opposite direction and absorbs the solvent. The lower the relative speed of the paper and water, the more completely is the alcohol absorbed. The water-bath also has the effect of immediately fixing the collodion upon the paper, but the coating remains sufficiently soft and elastic to be rolled to any degree of tenuity under the water, if rollers are provided for that purpose, the last traces of liquid being expressed by this means. Instead of using rollers in the water-bath the thickness of the layer can, however, be previously regulated, for example by making the material ascend at an angle after the application of the mixture, so that the excess of mixture flows off in a uniform manner. The steeper the direction imparted to the material and the slower its speed, the greater becomes the tenuity of the coating; this tenuity may also be increased by diluting the solution. The coated paper or other material is then placed in a drying chamber and the water is transferred to a distilling apparatus for the purpose of recovering the alcohol therefrom. The solvent is, therefore, not lost and the process of coating the paper is entirely continuous. There is no risk of tearing the paper while it is wet.

Figures 1 and 2 show an apparatus to carry out the process. The two illustrations differ from one another as, according to Fig. 2 the substance is guided upward by an inclined slit before entering the water bath.

*a* is the substance to be coated which is unwound from the roller *b*. It enters the closed chamber *e* in which are the coating cylinders *c*, *c'*, the latter of which receives the collodion solution from the reservoir *d* and transfers it by pressing onto the substance. The substance coated in this manner is passed on to the inclosed waterholder *f* in which the water flowing from the water pipes *h* and running off at *i* meet it. After the substance has also passed through the pressing cylinders *g*, *g'*, it is taken from the water-holder.

In Fig. 2 the division of the two chambers

is made vertical, and not horizontal, by the insertion, if necessary, of an adjustable partition which is provided with an inclined slit. In consequence of this arrangement, 5 on entering the water-holder the coating is skimmed off the substance at any desired thickness.

What we claim as our invention, and desire to secure by Letters Patent of the 10 United States, is:—

1. The process of coating paper, glass or other material with a mixture of collodion solution and powdered metal which consists in applying said mixture to the material, 15 passing the coated material through water, whereby the solvent is absorbed by the water and the residual coating fixed, and subjecting the coated material to pressure.

2. The process of coating paper, glass or 20 other material with a mixture of collodion solution and powdered metal which consists in applying said mixture to the material, passing the coated material through water, whereby the solvent is absorbed by the

water and the residual coating fixed, and 25 subjecting the coated material to pressure while under water.

3. The process of coating paper, glass, or other material with a mixture of collodion and powdered metal, which consists in ap- 30 plying said mixture to the material, causing the latter to travel during the application of the mixture, subjecting the coated material to the action of cold water flowing in the opposite direction to the direction of 35 movement of the material and in contact with the material whereby the solution will be absorbed and the residual coating fixed and finally subjecting the coated material to pressure while under water. 40

In witness whereof we have signed this specification in the presence of two witnesses.

JACOB GALAY.  
BORIS GALAY.

Witnesses:

GUSTAV E. HASTINGS,  
H. BECKEL.