

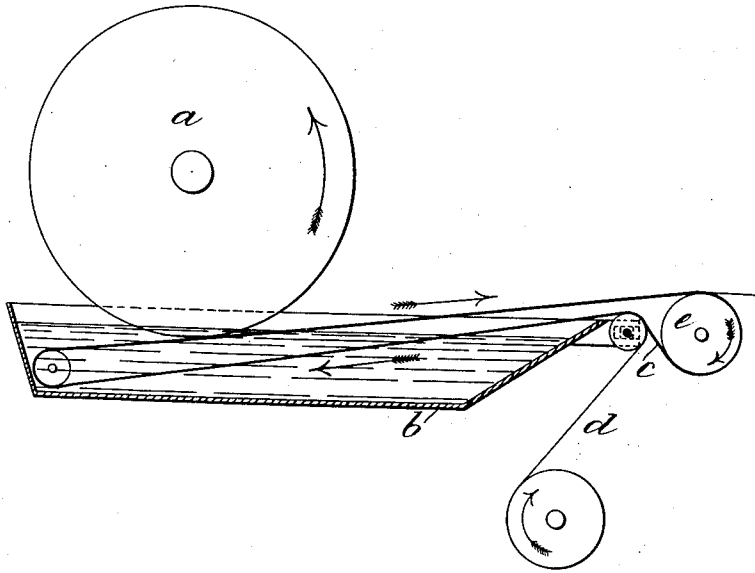
F. DEMEL.

PROCESS FOR THE MANUFACTURE OF METALLIC FILMS.

APPLICATION FILED MAY 1, 1911.

1,056,641.

Patented Mar. 18, 1913.



Witnesses.
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UNITED STATES PATENT OFFICE.

FRITZ DEMEL, OF LONDON, ENGLAND.

PROCESS FOR THE MANUFACTURE OF METALLIC FILMS.

1,056,641.

Specification of Letters Patent.

Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, FRITZ DEMEL, a subject of the German Emperor, residing in London, England, and whose post-office address is 63 Theobalds road, in the county of London, England, gold-beater, have invented a certain new and useful Process for the Manufacture of Metallic Films, of which the following is a specification.

The chief difficulty in the manufacture of a substitute for gold leaf by electro-deposition of gold resides in making a leaf or film suitable for receiving the deposited gold and yet possessing the two properties essential for the applications of gold leaf, particularly in the book-binding trade, namely a degree of thinness sufficient for the production of clear impressions with fine lines, and the low degree of coherence which renders it possible to remove with a brush such portions of the leaf as have not adhered to the surface to be covered.

Since the gold must be deposited on an electrically conducting surface and such surface must afterward be stripped from its support, some backing capable of being so stripped must be provided for the conducting surface. If this backing, however, is adapted to be peeled from the support, and is so peeled, it militates against both the aforesaid properties, since it adds to the thickness of the film and is too coherent or tough. It is also impossible to dissolve the backing while the film is on the support and then to peel the film from the support, since a substitute for gold leaf which is to have the aforesaid properties must be too thin to be peeled in this manner. Protection of the gold surface by a varnish during the peeling operation is also impossible, since when this varnish is subsequently removed the thin film of gold will not have the necessary luster.

Now my present invention consists in preparing a metallic film or leaf suitable for the electro-deposition of the gold, on a backing which together with the leaf or film is subsequently removed from the support by a solvent incapable of attacking metal, and at the same time wholly or partly removed by the solvent from the metal, thus leaving a metallic leaf of the required properties and carrying an amount of gold per unit area which may be considerably less than that contained per unit area of beaten gold leaf.

The mode of making the metal film consists in first coating a smooth surface, such as the surface of a glass plate, with a thin layer of an adhesive material, such as gutta-percha applied in solution. When this layer is dry it is thoroughly brushed over with a metallic dust such as copper to render it electrically conductive. On this metallic surface a thin layer of silver is electrolytically deposited whereby the copper is united to a sufficiently coherent surface and finally a layer of gold is electrolytically deposited on the silvered surface. The gold having been electrolytically deposited on the silver, the plate is immersed in a solvent for gutta-percha and the metallic film is received on paper or the like as it leaves the glass.

On a large scale it is advantageous to construct the surface on which the metallic film is to be made, as a short cylinder preferably made of highly polished aluminium. This is coated with a thin layer of gutta-percha by revolving it slowly on its axis while its lower part is immersed in a solution of gutta-percha in 4 times its weight of a solvent consisting of equal weights of benzine and mineral naphtha; for instance a cylinder of 26 inches diameter may revolve once during a minute. The solvent is then allowed to evaporate until the layer is of such consistence that bronze powder or copper powder will adhere to it when brushed over it. This metal powder having been applied it is polished to produce a polished surface. The cylinder is now revolved with its lower surface in an electrolytic bath suitable for depositing silver and a thin film of silver (such as 0.005-0.007 mgm. per 85.5 sq. mm.) is plated on to the copper. The silver is washed and polished and the electro-plating process is repeated for depositing gold, the layer of gold being for instance 0.0045-0.008 mgm. per 85.5 sq. mm. The deposited layer is washed and polished. The cylinder is now revolved on its axis with its lower face immersed in benzine and the continuous strip of gold leaf substitute is allowed to fall, as the gutta-percha dissolves, on to a band of paper traveling tangentially in the same direction as and just beneath the cylinder, at a speed identical with the peripheral speed of the cylinder.

In the accompanying drawing, which is a diagrammatic section through an apparatus

suitable for removing the strip of artificial gold leaf from the cylinder, *a* is the cylinder, *b* the trough containing solvent, *c* an endless band, and *d* a strip of paper. The endless band is driven by the roller *e* at the peripheral speed of the cylinder *a*. The strip of leaf on cylinder *a* having been cut transversely with a knife falls off the cylinder as it passes through the solvent and is received and conveyed on the paper strip *d* which does not touch the cylinder or the leaf while this is on the cylinder.

A certain amount of gutta-percha remains on the back of the metal leaf, so that when the latter is required for gold stamping it can in most cases be used without any additional adhesive.

It is obvious that if the electro-deposition of gold be omitted and the silvered film be removed in the manner prescribed, a substitute for silver leaf will be obtained.

Having thus described my invention and the best means I know of carrying the same into practical effect, I claim:—

1. A process for the manufacture of a metallic film which consists in first applying to a surface a backing for the metallic film consisting of a layer of material soluble in a solvent incapable of attacking metal, then coating this backing with a film of metal and finally immersing the coated surface in a solvent incapable of attacking metal, thereby removing the backing together with the film from the support.

2. A process for the manufacture of a metallic film which consists in first coating a smooth surface with a thin layer of an adhesive material soluble in a solvent incapable of attacking metal, then applying a metallic powder to the adhesive layer so as to render it electrically conducting, then

electro-plating a layer of silver on the conducting surface, and finally immersing the coated surface in a solvent incapable of attacking metal so as to dissolve the adhesive material and remove the silvered film from the surface.

3. A process for the manufacture of a substitute for gold leaf which consists in first coating a smooth surface with a thin layer of an adhesive material soluble in a solvent incapable of attacking metal, then applying a metallic powder to the adhesive layer so as to render it electrically conducting, then electro-plating a layer of silver on the conducting surface, then electro-plating a layer of gold on the silvered surface, and finally immersing the coated surface in a solvent incapable of attacking metal so as to dissolve the adhesive material and remove the gilded film from the surface.

4. A process for the manufacture of a substitute for gold leaf which consists in first coating a smooth surface of revolution with a thin layer of an adhesive material soluble in a solvent incapable of attacking metal, then applying a metallic powder to the adhesive layer so as to render it electrically conducting, then electroplating a layer of silver on the conducting surface, then electroplating a layer of gold on the silvered surface, then cutting through the compound layer at one place and revolving the surface on its axis in a bath of solvent for the adhesive material.

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

FRITZ DEMEL.

Witnesses:

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