UNITED STATES PATENT OFFICE.

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PROCESS FOR THE MANUFACTURE OF METAL-FOIL PAPER SUBSTITUTES FOR HOT-EMBOSSING PURPOSES.

1,047,867. Specification of Letters Patent. Patented Dec. 17, 1912.

No Drawing. Application filed April 19, 1910. Serial No. 556,439.

To all whom it may concern:

Be it known that I, FRITZ C. WICKEL, a subject of the Emperor of Germany and the King of Prussia, residing at 5 Rue Michel Chasles, Paris, France, have invented new and useful Improvements in Processes for the Manufacture of Metal-Foil Paper Substitutes for Hot-Embossing Purposes, of which the following is a specification.

The manufacture of so-called embossed papers or foils which have on one side a color coating which will peel off under the influence of pressure and heat has reached a certain extent in consequence of the great commodity and cheapness of its application. So far, however, these kinds of papers are intended as substitutes for metal foil, and must therefore be made with aid of bronzes, the products hitherto manufactured had certain defects, the reason for which lies in the mode of manufacture. With reference to the gloss, they do not equal the metal foils. The embossing foils without paper backing are very brittle, whereas the embossing papers with paper backing require a specially prepared paper, so that the foil will smoothly and easily peel off in embossing. They therefore have the disadvantage, that they are very thick and comparatively stiff, so that sharp details are not easily produced in embossing.

For binding the metal film a watery medium is employed with the known embossing papers, such as a solution of gelatin with an addition of glycerin or the like. Hereby not only the original gloss of the bronzes used is greatly affected, but also comparatively large quantities of bronzes become necessary for producing a sufficiently covering coating. This does by no means improve the quality of the paper for the intended purposes, on the contrary only its price of manufacture is increased.

The present invention now refers to a process for manufacturing metallic embossing paper for hot and relievo embossing purposes, which does no more show the defects of the known papers.

For manufacturing the metallic embossing paper forming the subject of the present invention an extremely thin and impermeable tissue paper, preferably a fat and air proof parchment imitation tissue paper, or a tissue paper, such as used for the manufacture of the known carbon papers is employed. On this paper a suitable mixture of resin and wax is transferred by means of rollers, in a molten state and on one side only. The paper to be used absorbs very little fat, wax or resin. The latter adhere but to the surface of the paper without penetrating into the same. Therefore, the paper, under the influence of pressure and heat, yields the same again, which is important, as in addition to the layer of metal, also the layer of wax is hereby conveyed to the workpiece, which gives a greater brilliancy to it and protects it from oxidation. This conveying of a layer of wax for protection and for increasing the luster of a layer of metal conveyed at the same time is to my knowledge entirely new. This mixture of resin and wax is preferably prepared of hard components, such as 70 to 80 per cent. carnauba wax and 20 to 30 per cent. bees-wax, to which some colophony and ammonia may be added. Also an addition of stearin will be of advantage. The paper preliminarily coated with a wax mixture of this kind is passed between guides in a still hot and thus sticky state over a heated roller in a box, in which the bronze to be applied is contained, the said bronze thereby covering the waxed side of the paper in consequence of the adhesion. The surplus bronze is removed by means of soft rotary brushes and the paper is thereupon smoothed by being passed between two smooth rollers, pressed against each other in a regulable manner, of which rollers the one is hard and heatable, the other elastic. The bronzing of the waxed paper may be effected also in other manner, so by dusting the bronze powder by means of brush cylinders or the like onto the still sticky paper, or by spraying the powder by means of a compressed air bronze spraying apparatus using hot compressed air. The removal of the surplus bronze and the smoothing of the bronzed paper may then be carried out in the hereinbefore described manner.

The thickness of the wax coating must be so chosen, that a close but only thin layer of bronze is retained. Owing to the fact, that this layer of bronze consists of quite fresh, unmixed and pure, therefore well gleaming bronze and that the wax composition has the property of increasing together with the simultaneous effect of the pressure and heat the original gloss of the bronze

powder, metallic embossings are obtained which cannot be distinguished from those hitherto obtained with gold leaf or metal foil. The hardness of the wax composition allows of embossing the finest lines and designs with sharply detailed edges as only those parts of the embossing paper, which come into direct contact with the hot tool will melt out.

The embossings obtained with aid of the herein described embossing metallic paper are superior to those produced by imitation gold leaf, as the wax composition absolutely protects the metal foil transferred against oxidation and permanently keeps it so. In an analogous manner all metals and metallic colors to be had in form of bronzes may be employed. Furthermore the wax composition may be prepared by means of suitable additions such as small quantities of copal, shellac, Venetian turpentine and the like, so that the metallic layer to be transferred will securely adhere to any material without the same being prepared in any special manner.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. The herein described process of manufacturing metal foil paper, which consists in coating a paper having capacity for absorbing a minimum amount of fat, etc., by applying thereto upon one side only a layer of hard wax composition, causing it to adhere to the surface of said paper only, and applying a bronze powder thereto whereby the layer of wax forms a protection and serves to increase the luster.

2. The herein described process of manufacturing metal foil paper, which consists in coating upon one side only with a layer of hard wax composition a thin tissue paper capable of absorbing a minimum quantity of said composition, causing said composition to adhere to the surface of said paper without penetrating the same, subjecting the coated paper while the composition is in an adhesive condition to heat and pressure, simultaneously forming a protection and increasing the luster, then applying a powder.

3. The herein described process of manufacturing metal foil paper which consists in applying to a thin tissue paper, upon one side only thereof, a coating of resin and carnauba wax and bronzing the same and preventing oxidation and giving an increased luster to the metal foil paper.

4. The herein described process of manufacturing substitutes for metal foil paper for hot embossing purposes, which consists in coating a thin impregnable paper on one side with an adhesive consisting mainly of melted carnauba-wax, and depositing a powder thereupon.

Berlin, this fifth day of April, 1910.

FRITZ CARL WICKEL.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.