Patented Jan. 12, 1937

2,067,435

UNITED STATES PATENT OFFICE

2,067,435

ARTICLE OF MANUFACTURE FOR CONTINUOUS EMBOSSING

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No Drawing. Application December 17, 1935,
Serial No. 54,952

1 Claim. (Cl. 41—33)

This invention relates to a process and article of manufacture for continuous embossing and the like. More particularly, it relates to colored papers used in a heat transfer or tip printing process imparting a permanent fast color imprint or embossing on materials of various kinds.

In embossing fabrics as heretofore used, the materials from which color designs are made and placed on fabrics, generally are chemically unstable. Such colored fabrics eventually fade or their colors bleed, thereby becoming useless for the purpose intended. Furthermore, the papers from which the colors were transferred very often cracked and generally faded, thereby becoming ineffective. Coloring materials on such papers easily peeled off, easily take scratches and when used in embossing leave a blurred outline.

With the above and other disadvantages in view, it is an object of this invention to produce light fast coated papers, for embossing fabrics and the like, which will retain their coating characteristics over indefinite periods of time.

It is another object of this invention to provide colored coating material for embossing fabrics and the like, resistant to washing and to the action of ordinary mild chemicals.

One other object of the present invention is to provide a continuous method of applying chemically fast colors on fabrics under heat and relatively high pressure conditions to leave an embossing of lighter color effect than the fabric itself.

In addition to the above objects other objects will be apparent upon further reading.

In the preparation of the coating material used for impervious paper and the like, a paste or liquid is first prepared, depending upon the mode of coating desired.

Different types of paper are used onto which the coating is applied. Such papers preferably have a glassine or other hard impervious surface from which the embossing composition is easily removed during the embossing process. The papers may be of any different shade depending upon the type of coloring to be applied to the fabric or other receiving material. In addition to the above desired qualities of paper to be used, the heaviness or thickness may be varied depending upon the amount of composition used and upon the type of material to be embossed. For example, in the case of a very thin fabric to be coated, it has been found that a paper of very little thickness produces the best results. Thin papers can be used where the embossed effect is slight, as woven instead of pile fabrics, and the raised embossing on the cylinders acting on the papers will not crush them.

The preferred types of composition to be used in conjunction with the paper and on to which it is applied for the embossing process are important features of this invention. Since the embossing of fabrics and the like is effected by the use of heat and pressure, compositions having thermoplastic qualities are desirable. Such compositions include thermoplastic vehicles containing coloring agents and metallic salts. The composition as heretofore noted is applied to the paper either in paste or solution form, to permit effective adhesion onto the surface of the paper without the latter being affected.

Illustrative of the vehicles preferably used in the present invention are those of a natural or synthetic origin. They include shellac, plastic sulphur, phenol formaldehyde resins, known as "Bakelite" resins, vinyl condensation products, such as vinyl acetate, vinyl chloride, styrol and the like, gum mastic, sandarac, and glyptal, the latter being a condensation product of phthalic anhydride and glycerin. These vehicles may be used either singly or in combination in the composition.

The vehicles above indicated are soluble in the ordinary volatile solvents and are used for carrying dyes, pigments, lakes or toners to impart the desired color to the paper. Furthermore, the vehicle used must be compatible with the material on to which it is embossed and which with light fast colors will produce a very stable embossing on any type of fabric and like material.

The coloring agents include any of the following; methyl violet, alizarin dyes, azo dyes, malachite green, Victoria blue, Victoria green, lead chromate, ultramarine blue, burnt umber, burnt sienna, chromium reds, cadmium yellows, manganese blues, titanox, a titanium oxide compound mixed with barium sulphate, cobaltates and tungstates, zinc whites, kaolin, gypsum or carbon black.

Small amounts of metallic salts, acids or alkalies may be added to the composition to secure further reaction between the coloring agents and the material to be embossed. These may perform the function of mordants by activating the reaction between the fabric or other material to be coated and the coloring agents whereby the embossing is more resistant to light, to the action of dry cleaning solvents, water, acids, and alkalies. Such activating substances include copper sulphate, barium sulphate, calcium sulphate,

strontium sulphate, aluminum hydroxide, aluminum chloride, acetic acid, and muriatic acid.

Solvents are added in making the composition to effect solution of the vehicles and dispersion or solution of the coloring agents. Such solvents include alcohols, ketones, ethers and esters, all relatively low boilers to permit quick setting of the composition on the paper.

Examples of the preferred compositions used for the paper, are given as follows:

Example 1

	Parts by weight
Gum shellac	7.5
"Bakelite" varnish	7.5
Alcohol or ether	82.79
Coloring agent	3.6
Activating agent	½–1

Example 2

	Parts by weight
Shellac or mastic gum	7.5
Glyptal	12.5
Activating agents	½–1
Coloring agent	3–6
Solvent	82–79

Example 3

	Parts by weight
Phenol formaldehyde resin varnish	5
Phthalic anhydride resins	10
Mastic gum	5
Activating agents	½–1
Coloring agent	3–6
Solvents	82–79

The ingredients in each example are approximate and are mixed in the order given with aid of stirring or agitating. The resultant mixture is then applied to a paper surface. Where both sides of the paper are coated, the same may be passed through the composition and permitted to dry. Once the composition is dried on the paper, the latter is then ready for rolling and use in embossing.

The paper with a composition above disclosed applied thereon, is ready for use in embossing fabrics and other like materials. The embossing of fabrics with a paper of the type included in this invention is performed by passing the paper with the coated side against the spread fabric between hot rollers having dies thereon. As paper and the fabric pass thru the rolls, the heat and pressure of the latter cause the vehicle to melt and carry with it the coloring and activating agents; the impression and embossing being made by the hot rollers and the dies thereon. In this process of transferring the color from the paper to the fabric there is a fixing action due to the activating agents. Materials on which the process may be used are textiles, fabrics, pyroxylin coatings, metallics, woolens, cottons, silks, etc. without any subsequent shrinkage, either for single or multicolored embossing.

By the presently described invention, an article of manufacture is obtained which carries a non-peeling, non-scraping thermoplastic vehicle with coloring agents and activators, including toners, lakes, and mordants, for embossing or dry printing operation on all classes of materials. The application of dry heat and high pressure aids the chemical action between the composition, and the materials to be embossed. The embossing of flat work eliminates the numerous operations of washing, steaming and drying and makes possible the production of one or multi color effects in the embossing art. Colors produced by the articles of manufacture hereinabove mentioned are fast to light and in many instances also to washing and dry cleaning. The use of such papers in embossing effectively produces opaque light colors on plushes and corduroys, with the aid of heat and pressure. The temperature in the embossing treatment is about 250° Fahrenheit, in conjunction with the pressure of the rollers. The higher the temperature the greater the resistance of the transferred color to washing or dry cleaning.

In the composition used on the paper, the fixing of the vehicle and its color depends on the type of vehicle used and its compatibility with the coating to which it is applied. Furthermore, a chemical change takes place as a result of the heat and pressure application onto the embossed material or due to oxidation because of exposure of the material, thereby rendering it resistant to action of water, light and washing.

The spreading of the combination of vehicle and color on an impermeable paper in a coating of suitable thickness that will be transferred preferably by dry heat will result during embossing in a clean, clear outline of the design or pattern. By heat and pressure application, the color on the paper will be applied to one side of the material or carried thru the material to interlock in the interstices of the material and fill them by melting of the vehicle without any blur or bleeding of colors.

It is also possible according to the present invention to produce a colorless water impervious coating capable of permanently setting the embossing on a material by incorporating a metallic salt, or acid, or alkali in the vehicle or by the use of the proper coloring agent alone.

Papers with compositions as herein described are also effectively applicable for embossing woolen in one operation.

It is to be further noted that the present invention is applicable for dry printing of woolens.

Papers made according to the present invention are adapted upon the application of heat and pressure to permit transfer of the composition therefrom on to the woolen in order to obtain the desired embossed design.

While several preferred embodiments have been disclosed hereinabove, it is to be understood that various modifications as to steps of application, selection of materials and their relative amounts may be made without departing from the spirit and scope of the invention as claimed.

We claim:

An article of manufacture for dry embossing fabrics, comprising a carrier with an impervious layer thereon, and a thermoplastic composition having phenol formaldehyde resin, phthalic anhydride resin, mastic gum, an activating agent and a coloring agent, said article being adapted upon the application of dry heat and pressure to transfer the composition onto a receptive surface.

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