K. E. OLSON.

GILDING FILM OR LEAF.

APPLICATION FILED JUNE 15, 1909.

992,743. Patented May 16, 1911.

Fig. 1

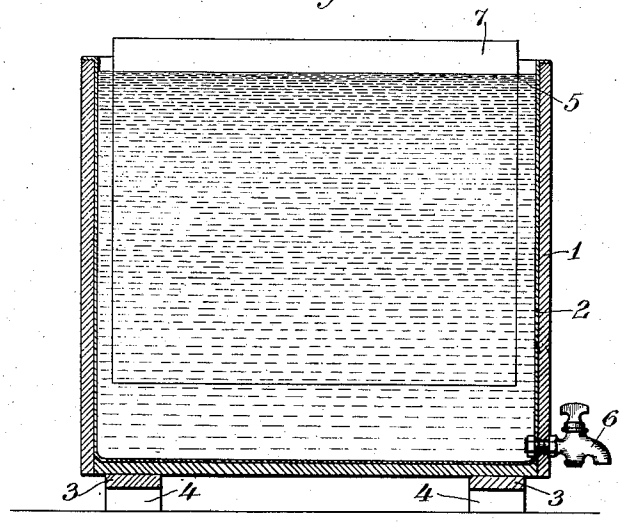


Fig. 2

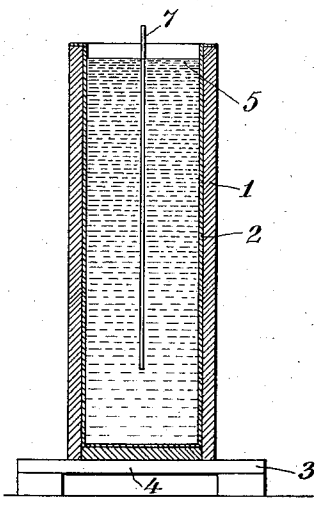
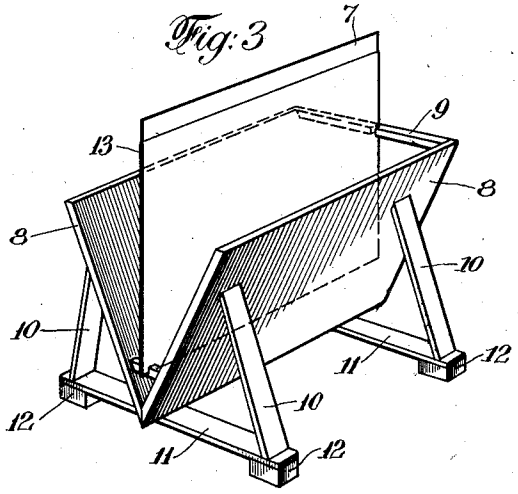


Fig. 3



WITNESSES:

W. A. Hutton

John O. Templer

INVENTOR

Karl E. Olson,

BY

Kenyon & Kenyon,

HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

KARL E. OLSON, OF IRVINGTON, NEW JERSEY.

GILDING FILM OR LEAF.

992,743. Specification of Letters Patent. Patented May 16, 1911.

Original application filed January 14, 1909, Serial No. 472,186. Divided and this application filed June 15, 1909. Serial No. 502,222.

To all whom it may concern:

Be it known that I, KARL E. OLSON, a citizen of the United States, and a resident of Irvington, in the county of Essex and State of New Jersey, have invented a new and useful Improved Film or Leaf, of which the following is a specification.

The invention consists in a new and improved film or leaf which is adapted for use in coloring or decorating paper, leather or other fabric, in a manner similar to that in which metal leaf, for example gold leaf, has heretofore been used, and is a division of my copending application Serial No. 472,186, filed January 14, 1909.

The object of my invention is to produce a film or leaf which has just the desired degree of toughness and durability, and which can be applied to the paper, leather, or other fabric, without the use of any sizing or similar adhesive material, and which will adhere firmly to such material so that it can not be easily rubbed or soiled, and which will not be affected by dampness or moisture.

My invention consists in a thin film or leaf containing a binder, a coloring matter, and a small quantity of a suitable gum. In the most complete form of my invention I also use a softening agent in combination with the other elements stated. In the best form of the invention known to me I employ soluble cotton as the binder, and I add to this a coloring matter, a small quantity of gum mastic, and a small quantity of glycerin in the manner hereinafter described.

In the films heretofore manufactured for the purpose of coloring paper or other fabric, it has been found that after the films have been attached to any of the above materials by means of presses or stamps, they are easily soiled and are quckly affected by dampness, and can be easily removed with water. It is also necessary to prepare such films with a size previous to stamping, in order to make the film adhere to the material. My invention is intended to obviate these difficulties by making the films waterproof homogeneous and relatively tenacious, and thereby rendering the finished product more durable, and by giving to the films an adhesive property, which does away with the necessity of previously sizing the materials to which the films are applied, and which thus saves both time and labor. I obtain the self-adhesive property of the film by adding a little gum to the solution from which the film is formed.

My improved film or leaf is made as follows. I dissolve soluble cotton in amyl acetate and benzin. For this purpose I prefer to use two ounces of soluble cotton to three pints of amyl acetate and one pint of benzin. I then add to this solution a suitable coloring matter, such for example as zinc white, though any other suitable color or dye may be employed. I add sixteen ounces of this coloring material to twenty ounces of the solution already described, and stir the mixture well until the coloring material is dissolved as thoroughly as possible. The solution is then strained through a fine sieve. To this mixture I add about half an ounce of gum mastic which has been previously dissolved in enough alcohol to make a concentrated solution. The quantity of gum mastic can be varied, but I prefer the proportion stated, since I have found that with about this proportion of a suitable adhesive the film will firmly adhere to most of the surfaces to which it is to be applied, and at the same time the surplus parts of the film can be very readily brushed away from the finished work, thus giving clear-cut outlines to the work. I have found that when more than about five per cent. of gum to a hundred per cent. of the solution is used, the film is made more tough and tenacious than is necessary to give the proper adhesiveness to the film for the average run of work. This increased toughness of the film prevents it from being so readily brushed away from the work after the dies have been impressed, thus requiring much greater care to avoid rough outlines in the finished work; but for certain classes of work, such as oily leathers and the like, it has been found necessary to increase the percentage of the adhesive in order to insure the proper adherence of the leaf to such surfaces, and in such cases I have found it necessary to increase the proportion of gum up to about ten per cent., but this proportion is only necessary where the surface to be decorated contains more or less oil. I then add approximately one ounce of pure glycerin, stirring the mixture rapidly. The mix-

ture is then poured into a tank such as is shown in Figure 1 of the accompanying drawings, and is left to stand for a few hours to allow any possible sediment to settle to the bottom. A plate of glass or other suitable material is then prepared in the following manner. Glycerin and water are mixed in equal parts, and an acid preferably muriatic acid is added to the liquid in the proportion of about five drops of muriatic acid to one ounce of the liquid. A small quantity of this mixture is then rubbed on to the surface of the glass plate with a piece of chamois skin, or some other suitable material, just enough of the mixture being applied to leave a trace upon the surface of the plate. This preparation is of such a nature that it will not mix with the solution which forms the film, and in this manner the film is prevented from adhering firmly to the plate. The plate is then dipped in the solution in the tank shown in Fig. 1, and is left there for a few seconds; then it is lifted up slowly in such a manner as to allow the excess of the solution to run off the plate and back into the tank.

Referring to Fig. 1, 1 represents the tank, which is provided with any suitable lining 2; 3, 3 are the cross-pieces underneath the tank resting upon the supports 4; 5 represents the solution, and 7 the plate which has been dipped therein; 6 is a cock for drawing off the solution from the tank.

Fig. 2 represents a vertical cross-sectional view of the tank with the plate therein, similar numbers indicating similar parts.

While I prefer to coat the plate by dipping the same in the solution as herein described, obviously the coating may be formed on the plate by placing the plate in the tank and pouring the liquid thereon or by flowing the liquid on the plate, although the latter is a less desirable method, and I do not wish to be understood as limiting myself to any particular manner of coating the plate with this solution.

When the plate is withdrawn from the tank it is placed vertically in a rack such as is shown in Fig. 3. As will be seen in this figure, the walls at the bottom of the rack are made to converge so as to be close to the plate. This is done so as to cause less circulation of air at the bottom of the rack, and thus to make the evaporation at that point less rapid, giving more time for the solution to run off at the bottom, and thus insuring an even film.

In Fig. 3, 8, 8 are the sides of the rack. 9 is the cross-piece joining these sides. 10, 10 are side supports for the rack; 11, 11 are cross-pieces supporting the rack at the bottom; 12, 12 are supports for these cross-pieces; 13 is the film which has been formed on the surface of the plate; 7 is the glass plate itself. After the film is dry, and before it is removed from the plate, I immerse it in a suitable liquid such as water for a few seconds to loosen it from the plate. The purpose of immersing the film in water is two-fold. First, the water coming in contact with the mixture of glycerin and muriatic acid causes a small amount of gas to be given off which helps to separate or free the film from the plate, and secondly, the immersion of the film in the water causes a slight contraction of the film, which in turn helps to prevent the adhesion of the film to the plate. It also renders the film more opaque. While the film is still wet it is cut into the desired sizes, after which it is left to dry. When thoroughly dry the film will become loose from the plate and can be readily removed therefrom. In the use of some coloring matter such as bronze powder it is preferable to remove the film while it is yet moist. In manufacturing films in this manner the side nearest to the plate has a smooth and glossy finish, while the reverse side is of a duller or mat-like surface. In this way the film may be used to produce two different kinds of effects. The film produced by this method is used in the same manner as metal foils. After applying the film to the object to be decorated, it is pressed upon the same by suitable presses or dies, these presses or dies having their bottom surfaces engraved or prepared with the letters or designs to be produced. After this the excess of the film is removed from the object, thus leaving a clean-cut impression.

The addition of the gum mastic to the mixture serves as a size, causing the film to adhere firmly and tenaciously to the object on which it is impressed.

I prefer to use a gum such as gum mastic as an adhesive agent to any other adhesive agent now known to me since such a gum is readily soluble in the binder solution which I use. The adhesive thus mixes intimately with the solution producing a leaf which is uniformly adhesive. Such a gum has the further advantage of rapidly drying and hardening and it will not make the leaf adhesive until a hot die is applied thereto. Thus the leaf may be readily handled without the disadvantage of any degree of stickiness and yet when the die is impressed the film firmly adheres to the surface to which it is applied. A further advantage of such a gum is that it is exceedingly tenacious and a smaller quantity of adhesive can be used for the same degree of adhesiveness of the leaf than any other adhesive agent now known to me which can be properly distributed in the leaf. This feature is of considerable advantage since if too great a quantity of any adhesive agent is used in the leaf it makes the leaf too tough thus hindering it from being readily brushed away from the work after the die is impressed. With an

adhesive such as gum mastic I obtain the desired degree of adhesiveness in the leaf without making the leaf perceptibly tough, due to the fact that such a small percentage of the adhesive is necessary. A further advantage of such an adhesive is that it is practically insoluble in water at ordinary temperatures and will not be affected by moisture. While such so-called adhesives as isinglass and albumen have been used singly and conjointly in leaves made for the purpose for which applicant's leaf is intended; such ingredients have been incorporated in such leaves not primarily as adhesives to cause the leaf to adhere to the surface which it is to decorate, but the primary function of these adhesives is to hold the leaf together, that is, to bind the different elements of the leaf and hold the elements such as the coloring matter in suspension therein. Such elements, therefore, are primarily binders, and in using such leaves a suitable size or adhesive element is always used for coating the leaf or the object to which it is to be applied.

The addition of the glycerin to the solution, softens the film and keeps it from becoming too brittle.

Bronze leaves heretofore manufactured have been open to one or more of the following objections: Some leaves have been manufactured by what is known as the dusting process, which necessitates a considerable loss of bronze powder during the manufacture of the leaf, and leaves a considerable amount of surplus powder on the leaf after it has been manufactured, which powder, not properly adhering to the leaf, is readily blown or brushed onto the background to be decorated, with its obvious resulting disadvantages. Other leaves have been manufactured in which, while there is not such a great amount of surplus powder, yet the leaf is either too tough to permit the surplus part of the leaf from being satisfactorily brushed away from the work after the die is impressed, or else too fragile to be handled without considerable waste.

The film manufactured by the above process is homogeneous and waterproof and will not crumble or give off its color. It has just the desired degree of toughness to allow it to be readily handled without waste from crumbling, it adheres firmly to the fabric without the employment of size, has a very satisfactory appearance or finish, and after the dies have been impressed, the surplus part of the leaf can be readily brushed away without roughening or damaging the outline of the work, thus producing clear-cut and highly satisfactory decorations or letters.

What I claim as new and desire to secure by Letters Patent, is:

1. A thin film or leaf containing a binder, a coloring matter, and a small quantity of a suitable gum which softens on application of heat to the film, whereby the film is caused to adhere to objects to which it is applied.

2. A thin film or leaf composed entirely of a binder, a coloring matter, a suitable gum which softens on application of heat to the film, and a softening agent.

3. A thin film or leaf made by evaporating a solution containing a suitable binder, a coloring matter, a small quantity of glycerin, and not more than about five per cent. of an adhesive agent which is readily soluble in said solution and which softens upon application of heat to the film.

4. A thin film or leaf containing soluble cotton, a coloring matter and gum mastic.

5. A thin film or leaf composed entirely of soluble cotton, coloring matter, a small quantity of gum mastic and a small quantity of glycerin.

6. A thin film or leaf formed by evaporating a solution containing a binder, a coloring matter, and a small quantity of gum which softens on application of heat to the film, the proportion of gum to the solution being about one-half ounce of gum to thirty-six ounces of the solution.

7. A thin homogeneous waterproof film or leaf containing soluble cotton, a coloring matter and an adhesive agent incorporated therein which softens upon application of heat to the film whereby the film is caused to adhere to objects to which it is applied.

8. A thin homogeneous film or leaf formed by evaporating a solution containing soluble cotton, a coloring matter, an adhesive agent which softens upon application of heat to the film, and a small quantity of glycerin, the proportions of the adhesive agent and gylcerin to the solution being respectively about half an ounce of adhesive agent and one ounce of glycerin to thirty-six ounces of the solution.

9. A thin film or leaf formed from a solution containing soluble cotton, a coloring matter, and a small quantity of a suitable gum dissolved therein.

10. A thin film or leaf formed from a substantially homogeneous solution of soluble cotton, coloring matter, a small quantity of a suitable gum, and glycerin.

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

KARL E. OLSON.

Witnesses:
EDWIN SEGER,
T. E. RAFTERY.