UNITED STATES PATENT OFFICE.

JULIUS A. C. FICHTMUELLER, OF NEW YORK, N. Y., ASSIGNOR TO DIAMOND DECORATIVE LEAF COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

DECORATIVE LEAF AND PROCESS OF MAKING THE SAME.

976,994. Specification of Letters Patent. Patented Nov. 29, 1910.

No Drawing. Application filed October 21, 1908. Serial No. 458,914.

To all whom it may concern:

Be it known that I, JULIUS A. C. FICHTMUELLER, a citizen of the United States, and resident of the borough of Richmond, city of New York, county of Richmond, and State of New York, have made certain new and useful Inventions Relating to Decorative Leaf and Processes of Making the Same, of which the following is a specification.

This invention relates to decorative leaf comprising a body of metallic or other coloring matter suspended in a suitable carrier and having on one or both sides if desired a suitable adherent layer of protector preferably comprising colloidal material so as to effectively protect the coloring matter in the body layer from tarnishing or other deterioration. Such leaf may of course be used as substitute gold leaf or colored decorative leaf used in decorating, such as sign work, book-binding and so forth, and may be produced for example by spraying upon sized backing fabric a layer of protector, then a layer of the carrier and incorporated coloring material, then if desired another layer of protector in such way that the whole becomes united or incorporated in drying for example into a single leaf or film which may be removed by treating the fabric with a loosening agent capable of dissolving or otherwise loosening or disintegrating the size on the fabric without acting upon the leaf which may then be transferred to a suitable support for drying, cutting and packing.

Decorative leaf may be made by this process of practically any thickness desired, such thin leaf being readily produced as to be entirely satisfactory for use in fine book-binding decoration in the same way as gold leaf and the carrier and protector may be formed of such material that the leaf will become firmly adherent to the leather, cloth or other material of the book without the necessity of a preliminary sizing thereof. The coloring matter of suitably pulverized metal or other material, preferably in very finely divided condition, may be embedded and inclosed in a suitable protective carrier or binder formed of suitable resinous gums or other material having sufficient toughness and pliability when in thin sheets of films. Resinous gums, such as shellac, copal, sandarac, gamboge, mastic, dammar, camphor, benzoin, pontianac, and so forth, are suitable for this purpose and may be used either separately or incorporated together in suitable proportions, nitrated starch or cellulose being employed in some cases if desired. Such binding materials may of course be dissolved in any suitable volatile organic solvents therefor, such for example as alcohols, including wood, grain or amyl alcohol or their esters, such as amyl acetate or in acetone or other ketones, ethers, turpentine, and so forth. The protector may be formed of generally similar material, preferably comprising suitable colloidal material to more effectively prevent injurious atmospheric action and should of course be so thoroughly united with the carrier and incorporated coloring matter forming the corresponding portion of the body of the leaf as to constitute when completed a single tough pliable leaf, this being effectively accomplished for instance by superimposing the layers of protector and body material before the solvent liquids have unduly evaporated therefrom.

A suitable protector liquid may be prepared by dissolving three to four parts of camphor, two to three parts of gum gamboge, which may if desired be used to slightly increase the red tinge in bronze leaf, one to three parts of sandarac, two to four parts shellac and one to four parts of soluble nitrated cellulose in sixty-four parts of amyl acetate and sixty-four parts of wood, grain or denatured alcohol. Another protector liquid may be prepared by dissolving four to six parts of refined white shellac and one part of gum amber or gum copal in thirty parts of wood alcohol and twelve parts of acetone. A suitable illustrative carrier liquid for use in connection therewith may be prepared by dissolving three to four parts of camphor, three to six parts of shellac if desired and one to three parts of soluble nitrated cellulose in sixty-four parts of amyl acetate and ten parts of acetone. Another illustrative carrier liquid of this character may be prepared by dissolving three parts of sandarac, three parts of mastic and one part of benzoin in thirteen parts of acetone, twelve parts of benzole and four parts of turpentine; and another similar carrier may be made by dissolving four parts of white shellac and one or two parts of copal in

forty parts of wood alcohol and five parts of acetone. Before application three to six parts or so of the metallic bronze powder or other coloring matter, preferably in the extremely finely divided condition secured by flotation separation may be thoroughly incorporated with twenty-five parts of the carrier liquid which should of course be in a uniform condition secured by assisting the action of the solvents by heat and agitation if necessary, preferably with filtration of the resultant material before incorporation of the coloring matter therewith.

In making the leaf the protector liquid may be uniformly applied in any desired way as by spraying, for instance, to suitable sized backing, such as cloth, paper, or other material coated with water-soluble size, such for example as animal or vegetable glues or pastes or water-soluble gums to give it a substantially even surface. Then after the thin layer of protector has set sufficiently, as for instance by being exposed to the air for some seconds, a coating of the liquid carrier and incorporated coloring matter may be sprayed or otherwise applied thereto so as to become thoroughly incorporated throughout the impinging faces and inseparably united. The carrier liquid forming the leaf body may be applied so as to give a substantially uniform or a mottled or grained surface where, for instance, two differently colored carrier liquids are applied to the same surface, or if desired a body having any suitable design or pattern may be produced by spraying or otherwise applying carrier liquid through a stencil or the like. Then if desired another thin layer of protector may be sprayed or otherwise applied to the layer of carrier and coloring matter forming the body of the leaf preferably after it has become set to the desired extent. The leaf on the backing may if desired be further dried by artificial heat or otherwise so as to produce a tough pliable leaf in which the metallic or other coloring matter is embedded in the body and inclosed on one or both faces by the practically integral layer or film of protector. The leaf may then be removed from the backing fabric by the use of any desired loosening agent, as for example the coated backing fabric may be immersed or otherwise treated with a suitable size solvent or loosener capable of dissolving or loosening the size without objectionable action on the leaf. With such water-soluble sizes as indicated immersion of the coated fabric in a tank of water for the desired time is usually sufficient, the water impregnating the paper or other fabric which should preferably be of an open texture and dissolving or loosening the size, thus rendering the leaf loosely adherent to the backing fabric, although of course it is understood that in some cases a substantially water impervious backing material having a surface of the desired character formed in any way may be used, where the loosening fluid or other loosening agent can either operate for a sufficient time or act effectively through the backing or leaf.

By applying a suitable support, such for instance as a sheet of cloth or paper to the leaf and removing the same from the water or other loosening agent, the compound fabric may be roughly dried and placed in position so that the leaf lies upon the supporting fabric after which the backing fabric may be readily removed leaving the leaf resting upon the support on which it may be dried, cut to size and mounted in the usual way for subsequent utilization. A convenient way of detaching the dry leaf from the backing fabric is to apply to the leaf the supporting fabric and immerse the compound sheet in a tank of the desired size solvent or loosener with the backing fabric uppermost. Then when the loosener has detached the leaf from the backing fabric the whole may be removed from the water, roughly dried and the backing fabric removed, leaving the leaf loosely lying upon the supporting fabric for subsequent treatment. It is of course understood that those familiar with this art can readily carry out this process in a continuous manner by the use of long webs of backing and supporting fabric formed of cloth or suitably prepared paper passing through suitable tanks or otherwise being subjected to the coating and loosening processes, the process being described in connection with separate sheets for the sake of simplicity.

It is of course understood that carriers and protectors formed of other substantially water-insoluble gums or other binding material may be similarly used in connection with a water-soluble size and aqueous size solvent or loosener. Another such illustrative carrier and protector liquids may be composed of three parts of gum copal, two parts of gum sandarac dissolved in fifty parts of turpentine or other oily solvent in the usual way, with the aid of heat if desired, before incorporating in the case of carriers the metallic or other coloring matter, such for example as anilin or the like. Another illustrative liquid of this description may be formed by dissolving one to three parts of soluble nitro-cellulose in a mixture of twenty parts of ether and one or two parts of alcohol in the usual way; three parts of white shellac are then dissolved in forty parts of acetone and five parts of amyl acetate and mixed with the other solution. If desired, however, the carrier or protector liquid may be composed of casein or water-soluble gums, glues or the like provided the size solvent or loosening agent is of such character as not to undesirably act on the leaf

after it has been formed upon the backing. An illustrative liquid of this kind may be formed by dissolving five to eight parts of bleached fish glue or isin-glass in fifty parts of water and two parts of glycerin with heating and agitation during which the coloring matter is preferably incorporated after the binding material has been dissolved when the material is to be used as a carrier. Such a carrier or protector may be used in connection with backing fabric which has been sized for example with shellac or other gums and in such case the size solvent or loosener may be wood or grain alcohol or acetone or a mixture thereof. Of course, when turpentine soluble gum is employed as the size the size solvent or loosener may be turpentine, naphtha, benzol or the like so long as it has no substantial injurious effect on the carrier or leaf upon the backing fabric.

Having described this invention in connection with a number of illustrative ingredients, formulas, proportions, and methods of operation, to the details of which disclosure the invention is not of course to be limited, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

1. The process of making decorative leaf which consists in forming a liquid protector by dissolving approximately three to four parts of camphor, two to three parts of gum gamboge, one to three parts of sandarac, three to four parts of shellac and one to four parts of soluble nitrated cellulose in sixty-four parts of amyl acetate and sixty-four parts of alcohol, in spraying the same upon backing fabric coated with water-soluble size, in substantially uniformly spraying thereon a carrier liquid formed by dissolving approximately three to four parts of camphor, three to six parts of shellac and one to three parts of soluble nitrated cellulose in sixty-four parts of amyl acetate and ten parts of acetone with which metallic coloring matter has been incorporated so as to form a body on said backing and in spraying thereon additional protector liquid and drying the same to form adherent to said backing fabric an integral compound leaf having a body comprising metallic coloring matter and a protector layer on both sides of the same, in immersing the same in aqueous size solvent to dissolve or loosen the size on said backing fabric and in detaching said leaf from said backing while in substantial contact with a supporting fabric.

2. The process of making decorative leaf which consists in forming a liquid protector by dissolving approximately three to four parts of camphor, two to three parts of gum gamboge, one to three parts of sandarac, three to four parts of shellac and one to four parts of soluble nitrated cellulose in one hundred and twenty-eight parts of volatile organic solvents therefor, in spraying the same upon a backing, in substantially uniformly spraying thereon a liquid carrier formed by dissolving approximately three to four parts of camphor, three to six parts of varnish gums and one to three parts of soluble nitrated cellulose in seventy-four parts of volatile organic solvents therefor with which coloring matter has been incorporated so as to form a body on said backing adherent to said protector, in loosening the leaf from said backing and detaching the same therefrom.

3. The process of making decorative leaf which consists in spraying upon a backing a liquid protector comprising varnish gums and nitrated cellulose dissolved in volatile solvents therefor and in substantially uniformly spraying thereon, a carrier liquid formed by dissolving gummy colloidal material in organic solvents therefor and incorporating coloring matter therewith to form a leaf body adherent to the protector layer on said backing, in loosening the leaf from said backing and detaching the same therefrom.

4. The process of making decorative leaf which consists in spraying upon a backing a liquid protector comprising dissolved colloidal material, in spraying thereon a liquid carrier comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the protector layer, in loosening the leaf from said backing and detaching the same therefrom.

5. The process of making decorative leaf which consists in spraying upon a backing a liquid protector comprising dissolved protective material, in spraying thereon a carrier comprising dissolved binding material and incorporated coloring matter to form a body adherent to the protector layer and in loosening the leaf from said backing and detaching the same therefrom.

6. The process of making decorative leaf which consists in substantially uniformly applying to a backing a liquid protector comprising dissolved protective material, in spraying thereon carrier material comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the protector layer and in loosening the leaf from said backing and detaching the same therefrom.

7. The process of making decorative leaf which consists in applying to a backing a liquid protector comprising dissolved protective material, in spraying thereon a carrier comprising dissolved binding material and incorporated coloring matter and applying thereto additional liquid protector to form adherent to said backing an integral compound leaf comprising a body having

coloring matter and a protector layer on both sides of the same, in loosening said leaf from said backing and detaching the same therefrom.

8. The process of making decorative leaf which consists in spraying upon a backing a liquid protector comprising dissolved protective material, in spraying thereon a liquid carrier comprising incorporated coloring material and in spraying thereon additional liquid protector to form adherent to said backing an integral compound leaf having a body comprising coloring matter and a protector layer on both sides of the same, in loosening said leaf from said backing and detaching the same therefrom.

9. The process of making decorative leaf which consists in substantially uniformly applying to a backing a liquid protector comprising dissolved colloidal protective material, in spraying thereon liquid carrier comprising incorporated metallic coloring matter, and applying thereto additional protector to form adherent to said backing an integral compound leaf having a body comprising metallic coloring matter and a protector layer on both sides of the same, in loosening said leaf from said backing and detaching the same therefrom.

10. The process of making decorative leaf which consists in substantially uniformly applying upon a backing a liquid protector comprising dissolved protective material, in substantially uniformly applying thereon a carrier comprising dissolved binding material and incorporated coloring matter to form a body adherent to the protector layer and in loosening the leaf from said backing and in detaching the same therefrom.

11. The process of making decorative leaf which consists in applying to a backing a liquid protector comprising dissolved protective material, in substantially uniformly applying thereon a carrier comprising dissolved binding material and incorporated coloring matter and applying thereto additional liquid protector to form adherent to said backing an integral compound leaf comprising a body having coloring matter and a protector layer on both sides of the same, in loosening said leaf from said backing and detaching the same therefrom.

12. The process of making decorative leaf which consists in substantially uniformly applying upon a backing a liquid protector comprising dissolved protective material, in substantially uniformly applying thereon a liquid carrier comprising incorporated coloring material and in substantially uniformly applying thereon additional liquid protector to form adherent to said backing an integral compound leaf having a body comprising coloring matter and a protector layer on both sides of the same, in loosening said leaf from said backing by an aqueous loosening agent and detaching said leaf therefrom.

13. The process of making decorative leaf which consists in substantially uniformly applying upon a sized backing a liquid protector to form an adherent protector layer, in substantially uniformly applying thereto a liquid carrier comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the protector layer, in loosening the size secured to said backing and detaching the same therefrom.

14. The process of making decorative leaf which consists in substantially uniformly applying to a sized backing a liquid protector comprising dissolved colloidal protective material, in applying thereto liquid carrier comprising incorporated coloring matter, and applying thereto additional protector to form adherent to said backing an integral compound leaf having a body comprising coloring matter and a protector layer on both sides of the same, in treating said backing with a size loosening agent to loosen said leaf from said backing and detaching the same therefrom.

15. The process of making decorative leaf which consists in substantially uniformly applying to a backing fabric having a coating of water-soluble size, a liquid protector comprising dissolved protective material, in spraying thereon carrier material comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the protector layer and in treating said backing with aqueous size solvent to loosen the leaf from said backing fabric and detaching the same therefrom.

16. The process of making decorative leaf which consists in applying to a sized backing fabric a liquid protector comprising dissolved protective material, in spraying thereon a carrier comprising dissolved binding material and incorporated coloring matter and applying thereto additional liquid protector to form adherent to said backing fabric an integral compound leaf comprising a body having coloring matter and a protector layer on both sides of the same, in treating said backing with aqueous size solvent to loosen said leaf from said backing fabric and detaching the same therefrom.

17. The process of making decorative leaf which consists in applying to a sized backing a liquid protector comprising dissolved colloidal protective material, in applying thereto liquid carrier comprising incorporated coloring matter, and applying thereto additional protector to form adherent to said backing an integral compound leaf having a body comprising coloring matter and a protector layer on both sides of the same, in treating said backing with a size loosening agent loosening said leaf without substan-

tial injury from said backing and detaching the same therefrom.

18. The process of making decorative leaf which consists in applying to a sized backing fabric a liquid protector comprising dissolved protective material, in applying thereto carrier material comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the protector layer and in treating said backing with a size loosening agent loosening the leaf without substantial injury from said backing fabric and detaching the same therefrom.

19. The process of making decorative leaf which consists in forming a liquid protective carrier comprising organic gummy material dissolved in volatile solvent and coloring matter incorporated therewith, in spraying said liquid carrier upon sized backing fabric, in drying the same to form a leaf thereon, in treating said backing fabric with size loosening material to dissolve or loosen the size in said backing fabric adjacent said leaf and in detaching said leaf from said backing fabric.

20. The process of making decorative leaf which consists in spraying a liquid carrier comprising dissolved binding material and incorporated coloring matter upon a backing, in drying the same to form a leaf on said backing, in loosening said leaf from said backing and detaching the same therefrom.

21. The process of making decorative leaf which consists in substantially uniformly applying a carrier comprising gummy dissolved binding material and incorporated coloring material to a sized backing, in drying the same to form a leaf on said backing, in treating the same to dissolve or loosen the size adjacent said leaf and in detaching said leaf from said backing.

22. The process of making decorative leaf which consists in substantially uniformly applying a protective carrier comprising dissolved binding material and incorporated coloring matter upon sized backing fabric, in drying the same to form a leaf on said backing fabric, in treating the same with a loosening agent to dissolve or loosen the size adjacent said leaf and in detaching said leaf from said backing fabric.

23. The process of making decorative leaf which consists in substantially uniformly applying a substantially fluent carrier comprising dissolved organic binding material and incorporated coloring matter upon a sized backing fabric, in forming a decorative leaf adherent to said fabric in treating said fabric with a loosening agent loosening the size adjacent said leaf without substantial injury thereto and in detaching said leaf from said backing fabric while in substantial contact with a support.

24. The compound decorative leaf formed by spraying upon a backing liquid protector comprising dissolved collodial material, in spraying thereon liquid carrier comprising dissolved binding material and incorporated metallic coloring matter and in spraying thereon additional protector to form adherent to said backing an integral compound leaf having a body comprising metallic coloring matter and an adherent layer of protector on both sides of the same and in loosening and detaching said leaf from said backing.

25. The compound decorative leaf formed by applying to a backing liquid protector comprising dissolved protective material, in applying thereto liquid carrier comprising dissolved binding material and incorporated metallic coloring matter to form a leaf body adherent to the substantially transparent protector layer and in loosening and detaching the leaf from said backing.

26. The compound decorative leaf formed by spraying upon a backing liquid protector comprising dissolved colloidal material, in spraying thereon liquid carrier comprising dissolved binding material and incorporated coloring matter and in spraying thereon additional protector to form adherent to said backing an integral compound leaf having a body comprising coloring matter and an adherent layer of substantially transparent protector on both sides of the same and in loosening and detaching said leaf from said backing.

27. The thin pliable compound decorative leaf formed by applying to a backing liquid protector comprising dissolved protective material, in applying thereto liquid carrier comprising dissolved binding material and incorporated coloring matter to form a leaf body adherent to the substantially transparent protector layer and in loosening and detaching the leaf from said backing.

28. The process of making color leaf or artificial metal leaf which consists in providing a surface with a soluble adhesive, spraying the surface with an opaque compound, not soluble in the same liquid as the adhesive and then removing the said compound from the adhesive surface.

29. The process of making color leaf, or artificial metal leaf which consists in providing a surface with an adhesive, spraying a thin coat of a soluble cotton solution over said surface, then spraying a solution of soluble cotton with a metallic or any color powder and finally spraying a coating of soluble cotton solution whereby a metallic or color powder is sprayed over a surface and placed in between soluble cotton solution surfaces which protect it from atmospheric influences.

30. The process of making color leaf or artificial metal leaf which consists in placing a soluble adhesive on a surface, then apply-

ing a soluble cotton solution thereto by a spray which solution carries a metallic powder and spraying the said surface with this mixture until an opaque coating is formed, then drying said coating and finally immersing the same in a bath whereby the soluble coating is removed.

31. An article of manufacture consisting of a film of soluble cotton containing a metallic or color powder, said film deposited by a spray from solution on a surface of soluble adhesive.

32. An article of manufacture consisting of a film of soluble cotton formed by a spray from solution on which is placed a similar solution in the same manner containing a metallic or color powder.

33. An article of manufacture consisting of a thin film of soluble cotton deposited by a spray from solution with an opaque and similar mixture containing a metallic or color powder which is covered with the first mentioned mixture deposited by a spray from solution whereby a color leaf or an artificial metal leaf is formed.

JULIUS A. C. FICHTMUELLER.

Witnesses:
HARRY L. DUNCAN,
JESSIE B. KAY.