Patented Oct. 23, 1945

2,387,695

UNITED STATES PATENT OFFICE

2,387,695

METHOD OF MOUNTING PHOTOGRAPHS AND THE LIKE

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No Drawing. Application April 24, 1943, Serial No. 484,496

6 Claims. (Cl. 154—2)

The present invention relates to a method for the mounting of sheet material on a backing and more particularly to a method for the mounting of photographs, drawings, blueprints, pencil or charcoal sketches, graphs, maps, rice paper prints, paintings or other sheet material onto a backing of paper, cardboard, paperboard, linen or other fabric, wood, pressed wood, plywood, glass, metal, plastic material, asbestos or other flat surface suitable for mounting or the attachment of the named sheet materials for preservation or display purposes. The said method is especially adapted for the mounting and preservation of old documents which are fragile and cannot be mounted satisfactorily by the methods heretofore in use, such as by application of adhesives containing water, or the use of paste which requires substantial rubbing onto the surface which is to receive the backing and is likely to be injured by such rubbing, or by the use of thermoplastic material which is to be heat treated to an extent likely to injure the document or to discolor or eradicate indicia thereon.

The method hereinafter described is particularly adapted for the rapid and accurate mounting of photoprints on the ordinary pasteboard or cardboard mounts and remains attached for an indefinite period without curling or the raising of the edges under ordinary conditions of use. The method avoids the spotting or defacing of the edges of the mount as occurs with the use of an adhesive containing the ordinary non-aqueous solvents heretofore used in connection with adhesives for the purpose of mounting photographs and the like.

Referring to the prior methods for mounting photographs, sketches and the like, these methods have certain disadvantages or drawbacks which heretofore have not been successfully overcome. The method most generally used for mounting is to apply a paste or a liquid adhesive containing water to the back of the sheet to be mounted and then to attach the sheet to the backing with or without a coating of the adhesive applied to the face of the backing or mount. The use of such adhesive causes more or less wrinkling or distortion with more or less curling, so that it is generally necessary to keep the mounted material in a press for a period of about twenty-four hours to avoid permanent deformation. It appears that the curling which occurs is due to expansion or local contraction which takes place at the edges because of the absorption of water by the gelatine coating of the photograph or prints from the water of the adhesive and upon evaporation of the water, the coating leaves the outer and inner surfaces under unequal tension.

Another method for the mounting of photographs and the like in which adherence is obtained between the back of the sheet and the mount is to apply dry mounting tissue, which is thermoplastic, between the two surfaces to be joined and to apply heat and pressure by means of a sad iron, for example, until incipient fusion of the mounting tissue takes place. In carrying out this method, the proper temperatures are rarely employed and the results obtained by the ordinary person are unsatisfactory, although specially skilled persons are able to obtain satisfactory results in commercial operations where the temperature to which the dry mounting tissue is subjected is controlled within a range of about 25° F., as between 150 and 175° F., for example. In the use of this method, the heat employed generally produces curling by drying out the gelatine coating of the photograph or print, although this may be overcome satisfactorily by the use of a heavy cardboard mount, which however is relatively expensive. Furthermore, the use of heat in the method produces an ageing effect on the gelatine layer resulting in loss of elasticity and producing cracking when the gelatine coating has become brittle. It is of common occurrence in the use of this method to have the edges of the photograph or print curl upward so as to be freed from the mount to a distance of one-eighth to three-sixteenths of an inch inwardly from the margin of the photograph or print. By the use of substantial pressures on the combined sheet and mount during the mounting operation, the curling effect is minimized, but misalignment of the sheet on the mount frequently occurs, producing an inartistic and unsatisfactory result. In the mounting of stereoscopic photographs or pictures, the inaccurate mounting of the views prevents proper registration for stereoscopic vision in a stereoscope. In general, it is substantially impossible to obtain sufficient accuracy in mounting photographs and prints by the use of dry mounting tissue with the application of heat. Even with thermostatically controlled heat in the mounting operation, the accuracy in mounting is insufficient for the mounting of stereoscopic pictures and the inability to exactly control the position of each of the views to be combined renders this method of mounting substantially prohibitive in this field.

Another method of mounting which is commonly used is to apply rubber cement to each

of the surfaces to be combined and permitting the applied coatings to dry, after which the coated surfaces are combined in the substantially desired relationship. This method is satisfactory for ordinary purposes where accuracy is not required, but if the photographs or other material to be mounted are not properly aligned when the coated surfaces are joined, it is substantially impossible to correct the misalignment. Furthermore, the mounting method is slow because of the necessity of waiting for the vaporization or volatilization of the solvent present in the rubber solution which is applied before the surfaces can be joined.

One of the objects of the present invention is to provide a method for mounting photographs, prints, old documents and the like on a backing or mount which may be carried out with extreme accuracy and with substantially greater speed than is possible with the methods heretofore used.

Another object of the invention is to provide a method for the mounting of photographs, prints, designs, old and fragile documents and other indicia-bearing sheets on a mount or backing of paper, cardboard, pasteboard, cloth, wood, glass, metal or other flat surfaces which may be carried out rapidly and without the application of heat to the sheet to be mounted.

Another object of the invention is to provide a method for the mounting of photographs and the like, as described, which is rap'd, avoids the use of heat and in which no chemical action, as spotting out, or physical action, as curling, or other deleterious action takes place.

Another object of the invention is to provide a method for mounting photographs or prints on a backing in which a dry mounting composition may be used with a liquid which has no chemical or physical effect on the gelatine or protein coating of the photograph or print, to effect rapid and permanent adherence thereof to the backing.

Another object of the invention is to provide a method for the mounting of photographs and the like on a suitable backing of the character described which permits accurate centering of the photograph or print upon the base or mount so as to permit the rapid mounting of stereoscopic prints or photographs in aligned position for registration or superposition when viewed through a stereoscope.

Another object of the invention is to provide a method for the mounting of photographs and the like on a backing material in which adhesive means may be used to prevent overflow of the adhesive beyond the limits of the edges of the sheet or material to be mounted and by which a completely mounted product is obtained immediately upon the completion of the mounting or affixing steps of the method.

Another object of the invention is to provide a method for mounting photographs, prints and the like which may be carried out under a variety of climatic conditions under which the materials employed are stable and in which heating means, electrical or other expensive apparatus, are not required.

Another object of the invention is to provide a method for the mounting of photographs and the like upon a mount which involves the use of non-toxic materials which have substantially no ageing effect on the photographic emulsion or gelatine of the photograph or print and which may be readily used by a novice or unskilled person with rapidity and accuracy.

With these and other objects in view, the invention comprises the various features hereinafter described in detail and defined in the annexed claims.

The method of my invention is based on the discovery that a thin sheet of dry material, such as a polymerized vinyl ester, may be wetted with a solvent for the ester which does not dissolve or affect the gelatine coating on the photograph or print, so that sufficient partial solution of the ester takes place to cause adhesion to the surface to which it is to be attached without having a sufficient amount of the solvent present to necessitate evaporation thereof. It appears that the amount of the solvent present is so small that when the surfaces are joined, the solvent is absorbed by the fibers of the paper of the photograph or print by capillary or other action so that the usual drying is rendered unnecessary. It is probable that the solvent is gradually evaporated from the photograph or print, but such action is not apparent. After the sheet of the ester has been joined to the photograph or other sheet to be mounted, the exposed dry side of the ester sheet is treated with a small amount of solvent so as to slightly wet the same, causing a superficial solution of the polymerized vinyl ester in the said solvent, and while the surface is still damp, that is, substantially immediately, the sheet is mounted on the base material to which it to be attached. It is preferable to use a fibrous material such as paper, cardboard, pasteboard and the like material as a base or mount, but other porous or non-porous materials may be used if desired, such as wood, leather, modeling stone, or other porous stone, or metal, glass or other non-porous material.

In the preferred embodiment of the method of my invention, I preferably employ a sheet of thermoplastic dry mounting tissue of a polymerized vinyl ester, preferably polymerized vinyl acetate, which I have found has the desired rate of solution in sheet form with isopropyl alcohol when applied thereto by means of a swab or brush so as to coat the tissue with only a thin film or layer of the solvent. The isopropyl alcohol solvent has an advantage not possessed by other solvents for polymerized vinyl acetate, or partial solvents therefor, in that it does not dissolve the gelatin coating of photographs or prints to an appreciable extent, so that spotting out or other chemical effects on the photograph or print to be mounted is avoided. Dry mounting tissue of suitable composition in sheet form which is thermoplastic and contains polymerized vinyl acetate, such as are designed for mounting by the use of heat, are obtainable on the market and are suitable for use in connection with the method of my invention. Dry mounting tissue containing a polymerized vinyl ester and a softening agent or substances to increase the adhesive properties, as disclosed, for example, in the U. S. Patent No. 1,784,008, may be used to advantage in carrying out my invention, but it is to be understood that the composition as made thereunder is not to be used in accordance with my invention in the manner described in the patent for mounting by the use of heat and pressure, but by the method in which a solvent is used for superficial or partial solution in accordance with my invention. In this method, the superficial solution of the mounting tissue in the solvent is sufficient to carry a film of the solvent with the dissolved solute into the interstices of the back of the photograph or print to be mounted so as to form a bond with the fibers thereof.

The amount of the solvent which is used is so small that it is volatilized or evaporated from the body of the sheet which is to be mounted without being apparent or noticeable. As soon as the liquid solvent is applied to the other side, or exposed side of the mounting tissue, and this last treated side is joined to the face of the mount or backing on which it is to be mounted, the penetration of the coating of the solution of the ingredients of the mounting tissue is so rapid that after the sheets are pressed firmly together the mounting operation is completed. The said penetration is slow enough, on the other hand, so that before pressing the sheets together the photograph, print, or other sheet to be mounted, may be moved slightly or adjusted in position so as to be accurately positioned in the exact spot or position in which it is to be mounted. This is of special importance in connection with the mounting of stereoscopic pictures in which each of the views must be precisely and accurately mounted in order for the views to blend or superimpose in viewing through a stereoscope.

Compositions suitable for use in the method of my invention are disclosed also in the U. S. Patent No. 1,710,825, which are obtainable in sheet form on the market at the present time. It is to be understood however, that solutions of the polymerized vinyl ester as disclosed in the said patent are not usable or operative in connection with the present invention, as the amount of solution which would have to be evaporated in proportion to the amount of solute therein would be so large as to wet both the sheet to be mounted and the mount itself and the period of time required for evaporation of the solvent would be so great as to be out of question for use where speed of operation is essential and where presses or other mechanical means for applying pressure are unavailable or undesirable. By the method of my invention, the time which is normally required for applying a coating or film of the isopropyl alcohol onto the dry mounting tissue or other composition sheet used and mounting the photograph or print, or other sheet to be mounted, onto the backing sheet is ample for a partial solution of the composition in the solvent to take place, and furthermore, the speed of solution of the composition of the dry mounting tissue or sheet is slow enough so that in the use of a swab or brush for applying the liquid solvent, no substantial amount of the composition of the tissue or sheet is removed from the surface thereof. Also by carrying out the mounting operation in two steps by the application of the isopropyl alcohol or solvent to the surfaces to be joined, the differences in the working speed of individual operators becomes negligible since the time required for the application of the solvent and the joining of the two surfaces is substantially the same in all cases, for which the speed of solution of the dry mounting tissue composition in the solvent and the time required for the evaporation of the isopropyl alcohol or solvent from the surface to which it is applied before the joining operation gives ample leeway or allowance.

It is to be understood that the composition of the dry mounting tissue may be varied to a considerable extent in carrying out the method of my invention and the composition with polymerized vinyl acetate or ester may be varied to a considerable extent with the use of isopropyl alcohol or mixtures thereof with other alcohols or solvents in which the time of solution of the dry mounting tissue remains the same if the sheet to be mounted is not a photograph or print having a coating of gelatine thereon. If a photograph or print is to be mounted, it is preferable to use a substantially pure isopropyl alcohol, or isopropyl alcohol having such a minor percentage of impurities or other solvents that the gelatine coating of the photograph or print remains unaffected during the mounting operation.

For certain uses, as for mounting a painting on canvas on a backing of wood, for example, I may employ a dry mounting tissue sheet having about 30 parts by weight of polymerized vinyl acetate, 20 parts by weight of Batavia dammar, 10 parts by weight of ethyl cellulose and about 2 parts by weight of paraffin. In mounting the painting first onto the mounting tissue, the latter is preferably treated with isopropyl alcohol, or it may be treated with a mixture of isopropyl alcohol containing about 10 percent of methyl abietate or hydrogenated methyl abietate, which is applied to the mounting tissue in the usual way with a swab or brush. After the painting has been pressed onto the wetted surface of the mounting tissue, the back or untreated side of the mounting tissue is then treated with the isopropyl alcohol or mixture to form a film of partially dissolved tissue material which when pressed into engagement with the wood surface, or other backing on which it is to be mounted, the painting adheres tenaciously and remains in position without the curling of the edges or bulging of parts after pressure has been applied to fully unite the surfaces. While the painting is being applied to the surface, the back of the mounting tissue remains sufficiently fluid or plastic to permit slight movement by sliding the painting over the backing, or sliding parts thereof to prevent creasing or local bulging of the surface. If the painting to be mounted is large, it is preferable to place the painting on a desk or flat surface with the painting side down and to apply suitable weights, such as a large book or the like, so as to obtain even distributed pressure over the surface, but it is unnecessary to retain the weights on the surface for any substantial time as the bonding takes place substantially immediately.

The method of making the dry mounting tissue by the use of polymerized vinyl acetate or other ester is fully disclosed in the patents above referred to and need not be herein described, therefore. The method of making the mounting tissue containing Batavia dammar above described will be obvious to those skilled in the art and is mixed by the use of solvents, as for example, 14 parts of denatured ethyl alcohol and 54 parts of toluol with the other constituents in parts by weight as above set forth.

In the use of isopropyl alcohol in the method of my invention, the usual commercial form having a purity of about 99 percent is satisfactory. This material has a boiling point of about 82° C. and a flash point of about 14.5° C. (58.1° F.).

In the use of the dry mounting tissue, as above described, it usually happens that the tissue is not the same size as the picture or print to be mounted. It is generally preferable to select a size of the mounting tissue which is larger than the picture or print and to first moisture one side of the tissue with the isopropyl alcohol or other solvent used and then to mount the photograph or print on the moistened tissue. The excess of

the adhesive or tissue extending over the edges of the print or photograph or sheet to be mounted is then trimmed off by means of shears or a suitable cutter. The photograph or print is then ready for the final mounting step, in which the tissue side is then moistened with isopropyl alcohol or other solvent used and then placed in the approximate final position on the backing or mount and is then pressed into its final desired position by means of the pressure of the fingers with a slight sliding movement if necessary. By this means, stereoscopic pictures may be readily mounted and pressed into the final aligned position by the use of guide lines on the mount or base, whereby the failures due to errors in alignment are substantially eliminated.

It is to be understood in carrying out the method of my invention that various changes or modifications may be made in the details of the materials used and the mode of operation without departing from the spirit or scope of the invention as defined in the annexed claims.

I may for example form the dry mounting tissue to be used in the method of my invention by applying the composition in the form of a solution to rice paper or other thin sheet material not soluble in or substantially affected by the solution. The rice paper or other sheet material may be impregnated by means of an isopropyl alcohol solution of polymerized vinyl acetate or other polymerized vinyl ester and dried, although a more volatile alcoholic solvent is preferred, such as denatured ethyl alcohol, for example. In the use of dried impregnated paper, in the method of my invention, this material serves also as a partial backing and assists in the prevention of the formation of wrinkles or folds in the mounting operation, and assists also to some extent in the sliding or final shifting operation to obtain the desired final alignment, provided that the sheet has sufficient rigidity and body. The ordinary dry mounting tissue now on the market has sufficient body and rigidity for this purpose and may be satisfactorily used without the necessity of forming the mounting sheet as a separate operation.

It is to be understood, also, that various details of operation may be used in addition to the steps disclosed as will be apparent to those skilled in the art. If a photograph or print is to be mounted, it may first be treated with glycerine or other emulsion softening agent or plasticizer, such as ethylene glycol, for example, to assist in the prevention of ageing or hardening of the photograph or print.

By the term "indicia containing sheet" as employed in the claims is meant a sheet such as a photograph, print, drawing, map, painting, document or the like.

Having thus described the invention, what is claimed as new is:

1. A method for rapidly mounting a photograph or the like upon a backing medium without the application of heat which comprises moistening one side of a sheet of dry mounting tissue composed mainly of a polymerized vinyl ester resin with a solvent liquid composed mainly of isopropyl alcohol having a relatively slow solvent action thereon so as to obtain superficial solution of a portion of the said tissue without affecting the main body portion thereof and applying the underside of a photograph or the like to the moistened side of the said sheet and pressing the adjacent surfaces together to firmly unite the same.

2. A method for rapidly and accurately mounting a photograph or the like having a gelatine coating on one side thereof upon a porous backing material without the application of heat which comprises applying a thin layer of a solvent liquid containing mainly isopropyl alcohol to a sheet of dry adhesive material which is soluble at least in part therein to dissolve a superficial layer of the said adhesive material without substantially affecting the main body thereof, applying the non-coated side of the said photograph or the like to the surface having the solvent layer thereon and joining the adjacent surfaces without the application of heat, thereafter applying a thin layer of the said solvent liquid to the exposed surface of the said adhesive material to form a superficial layer of solvent containing some dissolved adhesive material without dissolving the main body portion of the said sheet, applying the moistened exposed surface to a sheet of porous backing material having indicia thereon for indicating the proper position of the photograph or the like to be mounted and immediately sliding the said photograph or the like into the desired final position with reference to the said indicia to accurately position the same and pressing the photograph or the like into contact with the said backing.

3. A method for rapidly mounting a photograph or the like having a gelatine coating thereon upon a fibrous backing medium of paper, cardboard or the like without the application of heat which comprises moistening one side of a sheet of dry mounting tissue composed mainly of polymerized vinyl acetate with isopropyl alcohol to obtain a superficial solution of the surface portion of the polymerized vinyl acetate without affecting the main body portion thereof, applying the non-coated side of the photograph or the like to the moistened side of the said sheet, pressing the adjacent surfaces together so as to firmly unite the same, thereafter moistening the exposed surface of the said sheet with isopropyl alcohol and while still moist, uniting the same with a fibrous backing medium to form a mount for the said photograph or the like.

4. A method for rapidly and accurately mounting a photograph, print or the like having a photographic gelatine coating thereon upon a porous backing of pasteboard, cardboard or the like without the application of heat which comprises using a sheet of dry mounting tissue composed mainly of a polymerized vinyl ester and which is substantially larger in size than the photograph, print or the like to be mounted, moistening the upper surface of the dry mounting tissue with isopropyl alcohol solvent to provide a superficial solution on the surface of the tissue without penetrating the body portion thereof, applying the non-coated side of the photograph, print or the like to the moistened upper surface of the mounting tissue and pressing the adjacent surfaces together, trimming off the exposed areas of the sheet extending beyond the edges of the photograph, print or the like, thereafter moistening the exposed under surface of the dry mounting tissue with the said solvent to provide a superficial solution of the surface portion of the said mounting tissue, uniting the moistened exposed under surface of the mounting tissue with a porous backing having reference indicia thereon to indicate the aligned desired position on the mount and urging the photograph, print or the like into the desired position by a sliding and pressing movement until it is in the aligned position.

5. A method for mounting an indicia containing sheet upon a backing by means of an intermediate medium of polymerized vinyl ester which includes the steps of applying a solvent composed mainly of isopropyl alcohol to the polymerized vinyl ester to provide a superficial solution of the said ester thereon without substantially penetrating the main body of the said medium and uniting the said sheet to the said backing while the said superficial solution of the ester is present on the said medium.

6. A method for mounting a photograph, print, drawing, sketch, map, painting, old and fragile document and the like upon a backing of paper, cardboard, paperboard, linen, canvas, or other fabric, wood, ply-wood, glass, metal, or other surface, which comprises first wetting the surface of a sheet material composed of a thin sheet of paper having dry polymerized vinyl acetate coated on both sides thereof with a small amount of a solvent composed mainly of isopropyl alcohol to provide a thin coating of solvent which operates substantially immediately to dissolve a small portion of the polymerized vinyl acetate coating, contacting the back of the photograph or the like with the wetted surface causing superficial penetration and bonding action with the material of the said back of the polymerized vinyl acetate solution and forming an intermediate combined product reinforced by said sheet material, wetting the exposed face of the said intermediate sheet material to provide a solvent coating containing dissolved polymerized vinyl acetate and applying the said wetted exposed face to the surface of the backing on which it is to be mounted to provide the final mount therefor.

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