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METHOD OF DECORATING LARGE SURFACES BY PHOTOGRAPHY

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This invention relates to a process for photographically decorating the surfaces of structures, and particularly theatre walls, exhibition stands, facades and the like. The principal object of the invention is to enable decorations to be applied directly by photography to the said surfaces, as distinct from former methods which comprised the photographic decoration of panels, plaques and wall coverings and the piece by piece application of such panels, plaques or coverings to the surface of the structure to be decorated. A process in accordance with this invention enables the surface of a structure to be decorated much more quickly and economically than heretofore and affords a much greater scope for the attainment of artistic, bizarre and other effects appropriate from the architectural design or features present or for the general art scheme to be adopted. It further enables a decorative ensemble to be tested on the site before the actual decoration is applied. Finally, it enables one decorative scheme to be substituted by another in a minimum of time and at relatively small cost. To give one practical example, the invention enables a cinema theatre to be decorated or re-decorated in a single night.

According to this invention a process for decorating structures of the kind in question comprises preparing the surfaces thereof by the application of a preliminary coating of a preparation such as plastic paint which is neutral to photographic emulsion and is adapted for imparting a bite or tooth effect sufficient for ensuring adherence of such emulsion, spraying the prepared walls or surfaces with a fast light-sensitive emulsion, projecting a decorative image on to the sensitized surface, and applying developing and fixing solution or solutions to the exposed surface by means appropriate for the quick covering of such surfaces with said solutions, whereby the photographic image is uniformly developed and fixed over the whole of such surface. The resulting images may be toned by any of the toning processes known to those versed in the art, as for example by the spraying or other widespread distribution of toning solution over the decorated surface.

The invention resides not merely in a general direction of the process of decoration but also in certain essential provisions for enabling the process to be practiced in a useful and advantageous manner. Primarily, the nature of the surface to be decorated must be appropriate for the treatment it is to receive. Thus, it must be made suitable for the adherence of the emulsion to be sprayed upon it. Also, it must be made neutral to that emulsion so that it can have no deleterious effect upon the sensitivity of the emulsion. Consequently, it is necessary to prepare the surface by applying a first coating, or substratum, of a liquid substance which will produce a covering not inimical to the emulsion but capable of affording a bite or tooth effect sufficient to ensure adhesion. The most advantageous preparation for this purpose is a plastic paint which is neutral to the emulsion to be used and which contains a solid constituent, such as finely powdered or disintegrated asbestos, this constitutent being a medium appropriate for imparting the aforesaid bite or tooth effect.

Next in order comes the character of the sensitizing emulsion. It has been suggested, for example, to sensitize the surfaces of fabrics and materials with gelatine, or gum, or albumen incorporating a bichromate. Any such method, however, is out of the question for the practical carrying out of the present invention on account of speed considerations, for in no case could an enlarged image thrown upon it give a printable speed. The invention requires the employment of a really fast emulsion in order that a practical exposure time may be adopted when using a projector for projecting images of such dimensions and degrees of enlargement as are required for covering an entire wall, stage, or structure. Thus, a speed of about 5 H. and D. is required in order that a practical exposure time may be possible. Furthermore, the nature of the emulsion must be such as to be appropriate for quick wide-spread distribution by means of a spraying device, and, finally, it must be of a sufficiently stable and durable nature for enabling it to be transported without deterioration to the site where it is to be used. As an example, the first step in the preparation of an emulsion is to determine, as by trial and error, a suitable viscosity for the spraying of the emulsion through an ordinary commercial spraying gun or similar spraying appliance. By adjusting the proportions of spirit, glycerine, chrome alum and other ingredients it is possible to achieve a suitable viscosity and to produce an emulsion which can be successfully sprayed. It is further necessary to test the emulsion under spraying conditions and to make microscopical examination of the test coatings, in order to make such further adjustment of the ingredients as may be necessary to satisfy the following requirements:— (a) the emulsion although churned up by the spraying gun and

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mixed with air must be of such a nature as to contain or occlude air bubbles of only very small size, (*b*) the emulsion must be capable of homogeneous and uniform distribution and (*c*) its presence as a coating should be practically invisible when the coated surface is viewed from a distance of a foot or so away. The second step is to adopt a suitable balance of silver bromide, gelatine/silver ratio, excess of soluble bromide, and a certain quantity of free organic acid such as citric acid, so that the emulsion is capable of remaining in good condition for several weeks. This enables the emulsion to be taken in jelly form to a job at any distance from its place of manufacture, and then to be re-melted to the necessary temperative for spraying as and when required.

By carefully determining the exact amount of silver required to give images of the requisite density and having the free acid present, it is possible, by using the correct exposure, to avoid over-development. That is to say, the image will develop right out to the desired density and will not blacken further. This is of importance when the performance of a decorating operation is carried out by ordinary workmen, for if they should be delayed a minute or two between the applications of the developing and fixing solutions, the image will, nevertheless, not develop out too dark.

An example of an emulsion suitable for the practical carrying out of the invention is as follows:—

A solution of 1 kilogramme of silver nitrate is made in 7½ litres of distilled water at 50° C., containing 25 grammes of citric acid. This is poured slowly into a crock containing 17 litres of distilled water, in which are dissolved 0.7 kilogramme of potassium bromide, 0.6 kilogramme of gelatine and 30 grammes of potassium iodide at a similar temperature. The solution in the crock is stirred while the acid silver solution is poured into it. 0.8 kilogramme more of gelatine is then stirred in, and the emulsion kept at a warm heat of 50° C. for one hour. It is then set in ice, and after 24 hours remelted, and 1.25 litres of ethyl alcohol, 8 grammes of chrome alum previously dissolved in a litre of water, and 0.25 litre of glycerine are added. Such an emulsion will keep for two or three weeks, and can be repeatedly remelted.

According to the design of the artist or decorator, it may be desirable to use an emulsion giving soft, delicate gradation, or a very vigorous, to contrasting image. The emulsion given in the example has a gamma of about 3, and is a medium contrast emulsion for all-round work. Increasing the quantity of silver bromide or the proportion of potassium iodide will render the emulsion more vigorous in the known manner.

The choice of gelatine may have to be varied to render the viscosity of the emulsion suitable for the particular nozzle of a spraying gun. Coignet's or Nelson's No. 1, gelatine giving thinner or less viscous emulsions, while Heinrich's or Nelson's hard emulsion gelatine give more viscous emulsions. The right proportion is best decided on by actual trial. Equal parts of Coignet's and Nelson's hard emulsion gelatine will generally give a suitable viscosity.

The finished image can be toned by spraying or hosing with suitable solutions of well-known toning bath constituents. Also, a first image in one colour may be sprayed with acetate dope, whereupon a second coating of emulsion may be sprayed, exposed and developed and, if desired, may be fixed and toned to a second colour. By this means, it is possible to produce two- or three-colour pictures or decorative designs on the walls or decorative parts of a building or any structure in situ.

For some purposes, a combined developing and fixing solution may be sprayed. Thus, for example, a combined developing and fixing solution may be composed of metol 40 grammes, hydroquinone 130 grammes, sodium sulphite (crystals) 1 kilogramme, sodium carbonate (crystals) 1½ kilogrammes, potassium bromide 20 grammes, hypo 2 kilogrammes, and water to make up 20 litres. Also, a combined developing, fixing and toning solution may be sprayed. The final image may be washed with water spray and a final coating of cellulose or other suitable lacquer may be applied to preserve the surface decoration and to enable it to be cleansed by washing when desired.

For the purpose of preventing damage or undue wetting of premises in which the decorations are carried out a system of guttering with suitable sealing or packing may be applied along wall surfaces beneath the areas to be decorated, so as to collect and run off the solutions and wash waters employed in the process.

The surfaces treated may be of wood, such as the ply wood used for exhibition stands, shop display, cinematograph studio work, and so on. Or, when decorating buildings, the surfaces may be of cement, plaster, fibrous plaster, composition boards or slabs, and so on. The preliminary coating of plastic paint enables any of these surfaces to take and hold a coating of emulsion sprayed thereon and ensures that the emulsion cannot be deteriorated by any reactive matter contained in such surfaces.

Special decorative effects can be achieved by performing the process on surfaces already architecturally decorated by modellings in bas relief. Part of the effect is then attained by sculptured relief and part by the light and shade of photography, which, combined with the bas relief, produces a very mystifying effect of depth. Such an effect could not be achieved by ordinary photographic processes requiring the rolling on of emulsions or sensitive media. The improved process enables a completely constructed exhibition stand to be decorated exteriorly as well as interiorly over its whole surface in a very short space of time. The decoration may, of course, include advertisement features relating to the goods of the exhibitor and the surfaces treated may include those of walls, tower formations, roofs, canopies, show cases and other objects which could not possibly be decorated by ordinary photographic processes.

The light projection may be such as to illuminate the whole of the surface to be decorated, as by employing flood lights with stencils, negatives or positives between the lights and the said surface. Or, a projector capable of being directed progressively over the surface to be decorated may be used and may receive stencils, photographic plates or films bearing appropriate designs to suit different areas of the surface. As already stated, the emulsion has a sufficiently fast index for enabling a light exposure by such means to be carried out in a time which is practical having regard to all the attendant conditions.

We claim:—

1. Process for photographically decorating the surfaces of structures, and particularly theatre walls, exhibition facades and the like, comprising covering said surfaces with a preparation

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which is neutral to photographic emulsion and which is adapted for imparting a bite or tooth effect sufficient for ensuring adherence of such emulsion, spraying the covered surfaces with a fast light sensitive emulsion, producing an exposure of the sensitized surface by means of a light projector producing an image, and treating the exposed surface with developing and fixing agents sprayed in solution form by quickly acting distributive means.

2. Process for photographically decorating the surfaces of structures, and particularly theatre walls, exhibition facades, and the like, comprising coating said surfaces with plastic paint, incorporating a solid constituent for imparting a bite or tooth effect spraying on to the coat of plastic paint a fast light sensitive emulsion, producing an exposure of the sensitized surface by means of a light projector producing an image, and spraying, developing and fixing agents in solution form on the exposed surface.

3. Process for photographically decorating the surfaces of structures, and particularly theatre walls, exhibition facades and the like, comprising preparing said surfaces with a plastic paint which is neutral to photographic emulsion and which contains a solid constituent adapted for imparting a bite or tooth effect sufficient for ensuring adherence of such emulsion, spraying the prepared surfaces with a fast light sensitive emulsion physically constituted so as to have a viscosity suitable for spraying, producing an exposure of the sensitized surface by means of a light projector producing an image, spraying developing and fixing agents in solution form on to the light exposed surface, and spraying a protective and washable coating over the photographically decorated surface.

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