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ART OF MAKING COLORED SLIDES AND
THE LIKE

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This invention relates to the art of making colored slides and the like and has for its object to provide a simple and inexpensive method for the manufacture of transparent lantern slides and other objects in colors. Another object is to provide such a process by means of which colored images on paper may be transferred onto a transparency for use as a lantern slide and other purposes.

The production of colored lantern slides showing natural objects or works of art, for example, has been difficult heretofore, often requiring the hand coloring of such transparencies. The old decalcomania process, for example, has never been adapted to images requiring great detail, and neither has it been adapted for the application of colored slides because the colors are considerably opaque, whereas a lantern slide requires colors which are quite translucent. The use of photographic color transparencies is limited by their comparative density, cost and rarity, and also by the difficulty of obtaining duplicate copies. These difficulties have been so substantial that a lecturer often uses the reflection of opaque images from a printed paper and the like, but the difficulty here is the inability to get as satisfactory results as would be desired with a translucent slide.

According to this invention, translucent inks or pigments impressed upon a fibrous foundation like paper, can be transferred onto a transparent foundation in great detail.

For example, a transparency such as a glass slide is coated with an adhesive which is waterproof, an appropriate adhesive being a solution of flexible collodion, such as collodion flexible, U. S. P., consisting of camphor 20 gm., castor oil 30 gm., and a sufficient quantity of collodion to make about 1,000 gm. The transparent foundation is heated to about 175 degrees F. in about a minute and a quarter, accompanied by stirring of the adhesive to accelerate the vaporization of its volatile solvent contents and to prevent the formation of any gas bubbles beneath the colored image. This adhesive is affixed to the transparent foundation so that the adhesive coating will have a depth of about $\frac{1}{8}$ inch in the center and about $\frac{1}{16}$ inch at the edges before pressure is applied. The heating of the adhesive also assists in thickening it and making it more viscous and less likely to cause any of the dyes or pigments to run. The paper or other foundation containing the colored print is promptly pressed against the hot adhesive until the boiling ceases and the surplus gas has been squeezed out. After

being united the adhesive is given about twenty-four hours in order for it to set well. In applying the colored print, the adhesive with much of its volatile solvent driven off, is adapted to firmly adhere to the colored ink or pigment on the paper, without causing the colors to run. The precise reason for this is not fully understood, but under the microscope the colors seem to be embedded in the adhesive as in a mold. The adhesive film when set possesses the usual properties of flexible collodion in being hard yet somewhat flexible and transparent.

The paper or other fibrous foundation may be eliminated by dampening it and rubbing it away, for example, with water. After the paper has been removed leaving the colored image on the transparent adhesive, the image may be covered by a coating of, for example, one part by volume of damar gum and about four parts by volume of spirits of turpentine. This coating serves to brighten the colors and provide a smooth surface which will not diffract the light rays passing through the slide as much as it might without the coating over the color mold. This last coating may be applied by spraying or in other desired manner while the transparent foundation is hot. Later a cover glass may be applied over the adhesive film containing the colored image and made up as a lantern slide according to customary usage. If desired, the film may be removed from its glass foundation with the aid of water. Where the strength of the colors is desired to be enhanced, two or more adhesive films containing coated duplicate images may be brought together with the images in register.

This process is adapted to the transfer of any printed, drawn, painted, or written material applied with the aid of inks or pigments on paper, parchment, vellum, cloth or other appropriate fibrous foundation, without distortion of the image. As used herein, the term "colored" includes not only colored pictures or images in their ordinary meaning, but also the black and white images. The images, after being transferred to a lantern slide, are without the white background they originally possessed, yet the transmitted light may perform the function of the original foundation since the different colored inks or pigments differently affect the transmitted light. Drawings, for example, may be transferred by this process and the fibrous foundation washed away without the colors running. Slides may be made directly from prints, etchings, engravings, lithographs, wood cuts, mezzotints, photogravure or aqua-tints. The transparency

may be adapted for other uses than that of a lantern slide, for example, this process may be applied to decorate lamp shades and glassware in many uses, such as in trays, table tops, etc.

5 The varnish coating may be applied by spraying and is preferably heated but not above about 200 degrees F. Other protective coatings may be used, such, for example, as a colorless shellac. So, also, other adhesive films may be used with-
10 out causing the colors to run. For example, the transparent foundation may be coated with an adhesive comprising pyroxylin or nitrated cotton type of product with suitable resins and solvents therefor, of the type known commercially as Duco
15 cement, the same being generally sold in collapsible tubes. If the transparent foundation is a glass plate or slide about 3/64 of an inch thick, the desired temperature can be approximated with sufficient accuracy by placing it on a hot
20 plate of about 275 degrees F. for about a minute. Here again the print or other colored image is promptly brought in contact and pressed against the hot adhesive until all boiling ceases and surplus solution has been squeezed out, after which
25 the adhesive is allowed to set. While the adhesive is hardening the colored image may be pressed against the adhesive for example, under about a pound pressure. Neither of the adhesives suggested are sufficiently liquid to pene-
30 trate the paper or other fibrous foundation, which on its opposite side shows no effect of the adhesive coming through. In transferring prints from paper, after the adhesive is set, the paper may be removed by first dampening it, and then
35 rubbing it off. In some instances a minute amount of chalk may adhere to the print in the case of prints on coated stock and the varnish suggested has been found useful in brightening and enlivening the colors and in rendering any
40 chalk particles translucent instead of opaque.

Of the adhesives herein mentioned, flexible collodion is preferable as it seems to have less solvent effect on colors, whereas the Duco cement seems to possess a slight solvent effect upon cer-
45 tain types of dyes used in printing and causing them to sink to some extent into the paper.

I claim:

1. The method of transferring a colored image formed by ink or pigment on a fibrous founda-
50 tion onto a second foundation which comprises coating the second foundation with an adhesive capable of adhering more strongly to the image than it does to the fibrous foundation and with-
55 out causing the image to run, heating the adhesive on the second foundation until it appears to come to a boil in about a minute, to substantially eliminate a large part of a volatile solvent therein, promptly pressing the image and its fi-
60 brous foundation against the hot adhesive, removing the fibrous foundation without injuring the image and leaving the image retained by the adhesive on the second foundation after the ad-
hesive has set.

2. The method of transferring a colored image formed by translucent ink or pigment on a fi-
65 brous foundation onto a transparent foundation, which comprises coating the transparent foundation with a colorless adhesive capable of adhering more strongly to the image than the image
70 does to the fibrous foundation and without causing the image to run, heating the transparent foundation and said adhesive until the adhesive appears to come to a boil to eliminate a substan-
75 tial part of any volatile solvent therein, promptly pressing the image and its fibrous foundation

against the hot adhesive on said transparent foundation and allowing the adhesive to set, re-
moving the fibrous foundation leaving the image retained by the transparent adhesive.

3. The method of transferring a colored image
5 formed by translucent ink or pigment on a fibrous foundation onto a transparent foundation, which comprises coating the transparent foundation with a colorless adhesive capable of adhering
10 more strongly to the image than the image does to the fibrous foundation and without causing the image to run, heating the transparent founda-
15 tion and said adhesive until the adhesive appears to come to a boil to eliminate a substantial part of any volatile solvent therein, promptly
20 pressing the image and its fibrous foundation against the hot adhesive on said transparent foundation and allowing the adhesive to set, re-
moving the fibrous foundation leaving the image retained by the transparent adhesive, and coat-
25 ing the image on the transparent foundation and adhesive with a smooth transparent coating adapted to brighten the colors without causing them to run and to flatten the colored adhesive.

4. The method of transferring a colored image
25 formed by translucent ink or pigment on a fibrous foundation onto a transparent foundation, which comprises coating the transparent foundation with a colorless adhesive capable of adhering
30 more strongly to the image than the image does to the fibrous foundation and without causing the image to run, heating the transparent founda-
35 tion and said adhesive until the adhesive appears to come to a boil to eliminate a substantial part of any volatile solvent therein, promptly
40 pressing the image and its fibrous foundation against the hot adhesive on said transparent foundation and allowing the adhesive to set, re-
moving the fibrous foundation leaving the image retained by the transparent adhesive, said ink
45 or pigment being strengthened by the addition of another layer of transparent adhesive contain-
ing a second translucent image similar to and in registry with the first image.

5. The method of transferring a colored image
45 formed by ink or pigment on a fibrous foundation onto a second foundation which comprises coating the second foundation with an adhesive capable of adhering more strongly to the image
50 than it does to the fibrous foundation and capable of forming a mold-like impression for the image, and without causing the image to run, promptly
55 pressing the image and its fibrous foundation against the adhesive and removing the fibrous foundation without injuring the image and leav-
ing the image retained by the adhesive on the second foundation after the adhesive has set.

6. The method of transferring a colored image
60 formed by ink or pigment on a fibrous foundation onto a second foundation which comprises coat-
65 ing the second foundation with an adhesive capable of adhering more strongly to the image than it does to the fibrous foundation and capable of forming a mold-like impression for the im-
70 age without causing the image to run, heating the adhesive, promptly pressing the image and its fibrous foundation against the hot adhesive, removing the fibrous foundation without injur-
75 ing the image and leaving the image retained by the adhesive on the second foundation after the adhesive has set, and coating the image on said adhesive with a material to provide a comparatively smooth surface over said image.

7. The method of transferring an image formed by ink or pigment on a fibrous foundation onto

a transparent foundation, which comprises coating the transparent foundation with a hot transparent adhesive sufficiently viscous to form a mold-like impression for the image when it is pressed against the adhesive, and sufficiently free of any volatile solvent to prevent the ink or pigment running, and capable of adhering more strongly to the image than it does to the fibrous foundation, pressing the fibrous foundation and the adhesive together with the image there between, and removing the fibrous foundation without injuring the image whereby the image is retained in mold-like impressions in said adhesive,

and coating said transparent adhesive and image with a transparent material to provide a smooth surface over said image.

8. A transparent foundation having thereon a colored printed image embedded slightly in a transparent adhesive between the image and the foundation, said adhesive being capable of adhering more strongly to the colored image when the adhesive has set than said image would adhere to a sheet of paper upon which the image might be printed and which might be pressed against the adhesive before it had been set.

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