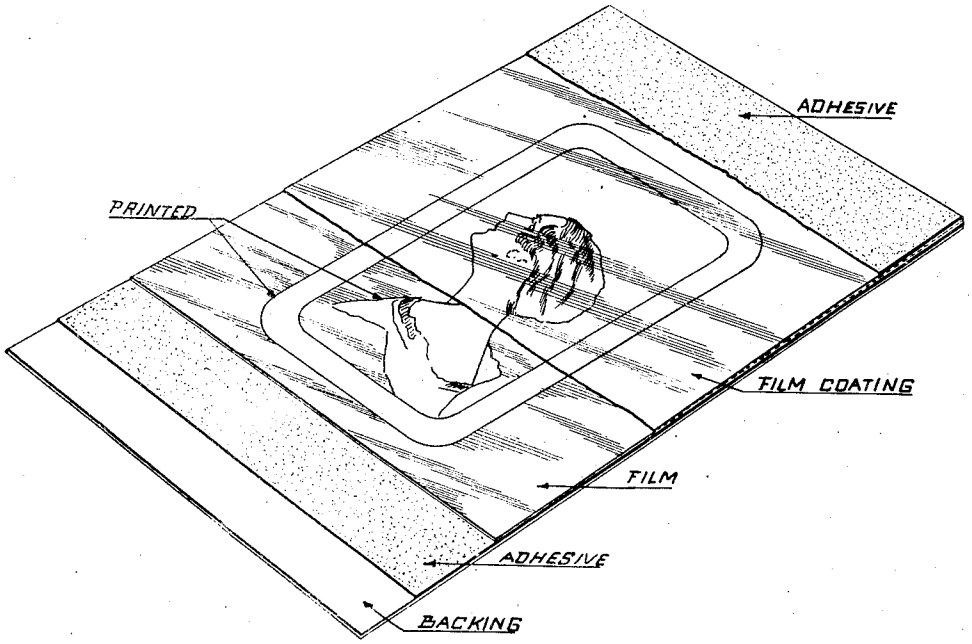
May 3, 1927. 1,627,407

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TRANSFER PRINT AND METHOD OF MAKING THE SAME

Filed Jan. 18, 1924



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Patented May 3, 1927. 1,627,407

UNITED STATES PATENT OFFICE.

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TRANSFER PRINT AND METHOD OF MAKING THE SAME.

Application filed January 18, 1924. Serial No. 687,016.

This invention relates to transfer prints and the method of making the same, the invention having been developed particularly with a view to providing transfer prints in a permanent form in which the printed matter is contained within a thin film or coating carried by a backing sheet of paper or other suitable material and in which the film containing the printed matter may be readily transferred from the backing sheet to glass or other surfaces.

I am aware that prior to my invention various processes have been devised by which printed matter has been transferred from specially prepared paper to glass and other surfaces, that various coatings have been employed to receive the printed matter and that in some instances the transferred printed matter has been on a film originally carried by the paper.

However, all prior processes of which I am aware have certain inherent disadvantages which greatly limit their utility. For example, prior processes for the transfer of photolithographic prints have had serious defects for the reason that the coatings upon which the printing was done were either of such a nature as to cause the ink to bleed or pick, and it has been extremely difficult to obtain a perfect register causing the lines to be indistinct and blurred, or the transfer film has been of such nature as to grease the stones so that the stone would not receive the ink properly, causing the print to be blurred and causing ink to adhere to portions of the stone outside the design. With the transfer prints as heretofore made by the decalcomania process, the transfer of the sign to a glass or other surface is a very delicate operation and can be carried out with uniform success only by a skilled workman for the reason that the inked portion only is transferred and the ink film so transferred is extremely fragile, liable to be broken by any slight slipping movement along the surface to which it is being applied.

It is an object of the present invention to provide a process by means of which perfect photolithographic prints or other printing can be made on the transfer sheet.

A further object is to provide composite transfer prints which may be manufactured in large quantities and be shipped and stored prior to use and adapted to form a sign of superior durability.

A further object of the invention is to provide a transfer print in which the design or printed matter is embedded in a thin tough film which is not liable to be damaged in the transfer operation since it can be straightened out or shifted on the surface to which it is being applied without damage thereto, and which does not require special skill to apply, and as illustrated on the accompanying drawing.

Other objects will be apparent from the following description.

The drawing shows a diagrammatic representation of the arrangement of the various parts composing the transfer print and in which the parts are designated by self-explanatory legends.

A transfer print made in accordance with the present invention consists of a backing sheet preferably of absorbent paper, a film containing the print secured by a suitable adhesive which is soluble in water to the paper and a coating of adhesive material on the outer side of the film which is suitable for firmly securing the film to the glass or other surface to which the film is to be transferred. The film is of a material which is insoluble in water, which will remain flexible for a long time after it is applied to the paper and which is adapted to receive photolithographic prints as well as other printed matter, the film being so treated in the process of manufacture, as will hereinafter be described, as to be thoroughly impregnated with the ink so that when the film is transferred from the paper backing to the glass or other surface, the surface can be washed without causing the ink to be separated from the film and without otherwise damaging the sign.

The present invention has been designed primarily to provide transfer sheets carrying advertising matter which can be shipped and stored and in which the ink of the printed advertising matter is impregnated in a relatively tough transparent film which can be readily transferred to a window pane by anyone without danger of damaging the sign in the transfer.

To transfer the ink impregnated film to a

pane of glass, it is simply necessary to wet the glass and press the film side of the transfer sheet against the glass taking care to squeeze out any air bubbles. The water on the glass moistens the adhesive on the face of the film so that when the adhesive dries the film is held firmly in place. After the transfer sheet has been applied to the glass as above described, the paper backing is removed by applying water thereto and peeling off, the water acting upon the soluble adhesive permitting the paper backing to be readily removed.

In preparing the transfer sheets, paper is first coated on one side with one or more coats of water soluble gum as in the ordinary decalcomania process. This, however, is not essential to applicant's process since if preferred, decalcomania paper or suitable gum paper suitable for my process can be purchased already prepared.

The gummed side of the paper is then coated with a relatively slow drying solution of a cellulose ester either alone or in combination with one or other substances such as resins, gelatin, rubber or similar material. Soluble nitrocellulose has been found to give very satisfactory results and is preferable because it is more readily obtainable than other suitable cellulose ester and is comparatively inexpensive. However, cellulose acetate, formate or other suitable soluble cellulose ester either alone or in combination with resins, rubber, gelatin, casein and other similar substances may be used. For example I have found that the following solution gives very excellent results:

8 oz. of soluble cotton dissolved in a liquid mixture containing:

¼ gallon of ethyl acetate, ¼ gallon of butyl or amyl acetate, ¼ gallon of benzol 90%, ¼ gallon of #1 formula ethyl alcohol, 6 ounces castor oil.

This coating when dried forms a thin flexible transparent film which does not distort the paper upon drying.

This film forms a surface suitable for any printing or reproduction process, for example, photolithographic as well as the ordinary printing methods, and does not cause the ink to pick i. e. adhere unevenly, so that any printing method most suitable for the character or work required may be employed.

Paper prepared as above described can be stored without deteriorization to provide stock for printing.

The ink transferred to the surface of the film in printing adheres to the surface thereof and, if not further treated, would tend to pull away from the film in the subsequent transfer operations. To avoid this difficulty I treat the printed surface of the sheet with a liquid which is a mutual solvent both for the carrier of the ink pigment and of the material of the film beneath so that the pigment of the ink becomes thoroughly impregnated in the film and will not run or smear in the subsequent transfer operations. Various solvents may be employed for this purpose but I have found that a cellulose nitrate solution similar to the solution used in making the film gives the best results, such a solution dissolves the surface of the film and the carrier for the ink pigment and causes the two coatings and ink pigment to be amalgamated into a single composite film without running or bleeding the ink. The outer coating is preferably but not necessarily formed by a solution similar to the first. All that is necessary is that the two solutions be such that the two coatings will become thoroughly amalgamated. Both coatings may be transparent or colored and translucent or one of the coatings may be opaque depending upon the effect sought to be obtained. The second coating, while similar to the first, preferably contains a higher percentage of high boiling solvent which causes the solution to dry more slowly than the first solution so that the solvent therein can act through the film of pigment upon the body of the underlying film, causing the material of the film to be integrally united through the printed film as well as in the unprinted spaces.

While as above pointed out, many compositions may be used for the second coating, I am giving the following as a composition which has proven very satisfactory in use and which will not bleed or run the ink or distort the design:

2 ounces of soluble cotton dissolved in a mixture containing:—

½ gallon of butyl or amyl acetate, ¼ gallon of 90% benzol, ¼ gallon of #1 formula ethyl alcohol, 2½ ounces of castor oil.

While I consider the addition of a second coating to the film to be preferable, it is nevertheless within the scope of my invention to simply apply a volatile solvent to the printed surface which will dissolve the surface of the film and the carrier for the ink pigment causing the ink pigment to permeate the film beneath it, so that when the film becomes dried the ink is incorporated therein.

After the ink impregnated film has thoroughly dried the exposed surface thereof is coated with a suitable adhesive which when moistened will cause the film to adhere firmly to the surface to which it is to be applied and which when set is insoluble in water so that the film cannot be washed off.

Transfer sheets manufactured as above described can be manufactured in large quantities and can be stored for long periods of time and for use at the convenience of the purchaser.

When employed for transparent window

signs for advertising purposes, the thin film does not in any way interfere with the washing of the windows since the film cannot be washed off and the ink which is impregnated in the film is not disturbed. It is not only much easier to transfer the films of transfer prints made in accordance with this invention than to transfer the signs heretofore formed by the decalcomania process, but the signs themselves are superior since the sign will not dog ear or break off around the edges as in the prior decalcomania and treated paper signs. The sign will last indefinitely and may be removed by scraping or by a suitable solvent.

Having described my invention, I claim

1. A transfer print comprising a backing sheet having a coating forming film thereon which is insoluble in water, said film carrying a design formed by pigments permanently impregnated in the body of the film.

2. A transfer print comprising a backing sheet, and a film secured thereto by a water soluble adhesive, said film being insoluble in water and carrying printed matter, the pigments of the ink being permanently impregnated in the body of the film.

3. A transfer print comprising a backing sheet having a film thereon formed from a drying solution of a soluble cellulose ester, said film carrying a design formed by pigments impregnated in the body of the film.

4. A transfer print comprising a backing sheet having a film thereon formed from a drying solution of soluble cellulose nitrate, said film carrying a design formed by pigments impregnated in the body of the film.

5. A composite transfer print comprising a sheet of paper having thereon a layer of water soluble adhesive, a film of material insoluble in water and containing printed matter composed of pigments impregnated in the body of the film interiorly thereof, said sheet and film being secured together by the adhesive, and a layer of adhesive on the surface of the film.

6. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a solution which upon drying forms a flexible film insoluble in water, printing upon said film and treating the film and printed matter with a mutual solvent for the substance of the film and the carrier for the ink pigments to cause the ink pigments to become impregnated in the body of the film.

7. The herein described method of making a transfer print which comprises coating a blacking sheet with a water soluble adhesive and applying to the coated surface a solution which upon drying forms a flexible film insoluble in water, printing upon said film, and coating said film and printed matter with a second solution which contains a mutual solvent for the substance of the film and the carrier for the ink pigments to cause the ink pigments to become impregnated in the film and additional coating and which upon drying becomes an integral part of the film.

8. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a solution of a cellulose ester which upon drying forms a flexible film insoluble in water, printing upon said film, and treating the film and printed matter with a mutual solvent for the material of the film and carrier for the ink pigment to cause the pigment of the ink to permeate the film.

9. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a solution of a cellulose ester which upon drying forms a flexible film insoluble in water, printing upon said film, and applying a second coating of a relatively slow drying solution of a cellulose ester.

10. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a solution of a cellulose derivative which upon drying forms a flexible film insoluble in water, treating the film with the printed matter thereon with a mutual solvent for the material of the film and the carrier for the ink pigment, and after the film is dry applying thereto a coating of adhesive material.

11. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a relatively slow drying solution of a soluble nitrocellulose, printing upon said surface, and treating the printed surface with a volatile solvent for both the material of the film and the carrier for the ink pigment.

12. The herein described method of making a transfer print which comprises coating a backing sheet with a water soluble adhesive and applying to the coated surface a relatively slow drying soluble nitrocellulose solution, printing upon said surface, and applying to the printed surface a similar soluble nitrocellulose solution which is relatively slow drying.

In testimony whereof, I hereunto affix my signature.

THOMAS S. REESE.