July 17, 1934. R. L. ATKINSON 1,966,942

TRANSFER PROCESS

Filed Jan. 20, 1932

Fig. 1

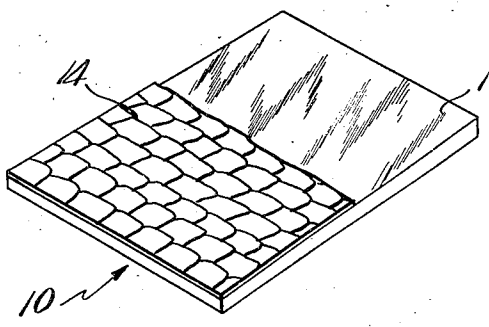


Fig. 2

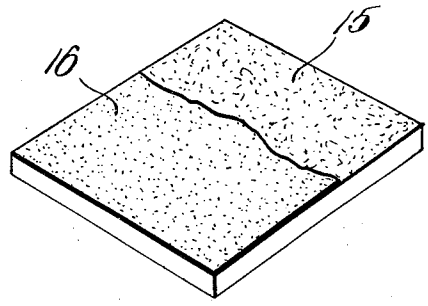


Fig. 3

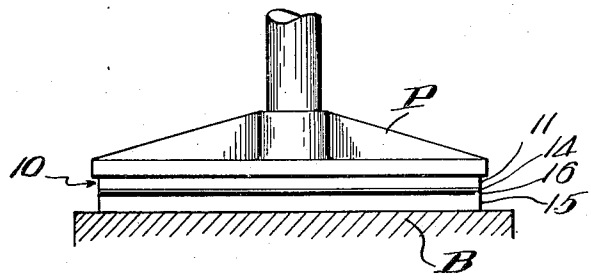
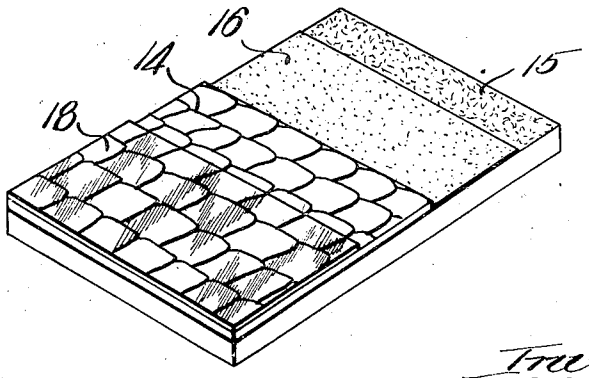


Fig. 4



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Patented July 17, 1934 1,966,942

UNITED STATES PATENT OFFICE

1,966,942

TRANSFER PROCESS

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Application January 20, 1932, Serial No. 587,759

14 Claims. (Cl. 41—33)

This invention relates to decorating by means of a transfer medium, and is particularly adapted for applying designs and decorations to the surfaces of articles such as leather, textiles, paper and other fibrous compositions, wood, metal, ceramics, stone, and in general on all articles on which the present so-called decalcomania is used.

The decalcomania process is one of the present commercial methods employed for decorating the surfaces of articles of the aforesaid character. A decalcomania for this purpose commonly consists of a backing of a suitable grade of paper coated on one side with a film of a water-soluble binder such as dextrine or glue. Upon this film is superimposed a film of oxidized linseed oil or the like, and the design is printed thereon. In employing the decalcomania, the surface of the article to be decorated is usually coated with one or two applications of a suitable coating such as nitrocellulose lacquer, preferably of a color best suited for harmonizing with the color or character of the design. The decalcomania is then applied to the article with the design against its surface, using heat and pressure, thereby bonding or consolidating the juxtaposed surfaces. In order to remove the paper backing it is necessary to wet the same sufficiently to soften the water-soluble glue or dextrine coating, whereupon the paper backing is peeled off. The glue film is then removed by washing, brushing or scraping, leaving the design adhering to the surface of the article. After drying, one or two coats of nitrocellulose lacquer are usually applied to protect the transferred film. Several modifications in the decalcomania process are practiced, but it is unnecessary to this invention to describe them in detail.

By the process of my invention, it is possible to simplify and improve this procedure considerably, not only giving a wholly satisfactory product but also achieving certain advantages impossible with the usual paper-base transfer.

In accordance with my invention, I use a transparent or semi-transparent film of any suitable material having a smooth, continuous and relatively non-absorbent surface to which printing ink will not readily bond. A film of this type need be only sufficiently translucent to allow the transfer to be registered in the desired location upon the article to be treated or decorated. Suitable materials for the transfer film include gelatine-glycerine films, wax-free glassine, and the various types of regenerated cellulose, such as cellophane, and other translucent sheets having a smooth, continuous and relatively non-absorbent surface, which is not affected by the application of moderate heat and pressure. A suitable film thickness, for example, would be 1/1000 to 3/1000 of an inch thick.

By the use of my process it is possible, because of sufficient transparency of the base or transfer sheet to place the design at any desired place upon the article to be decorated, as, for example, a piece of leather so as to register exactly with the graining or other features, or with any other design which may already be thereon.

By my process it is also possible to eliminate the steps of washing, brushing and/or scraping to remove the paper base and the glue or dextrine adhesive. The base of this invention may be readily peeled off immediately after the impressing upon the surface of the design which the base carries. The usual processes which involve washing to remove the decalcomania base are particularly objectionable in the treatment of leather, paper and other fibrous materials, which may become undesirably wet during the washing, thereby necessitating some sort of drying process which tends either to shrink and stiffen leather or cockle and blister fibrous materials, thus causing the design to assume a distorted appearance.

In carrying out my invention, the transparent transfer sheet is printed in any suitable manner with a design or other impression, using inks which will not bond permanently to the transfer sheet, but which readily separate therefrom and adhere to the article to be marked or decorated during the impression process.

I have found that "thermo-adhesive celluloid inks" are particularly suitable for my purpose, as they are selectively adhesive to the surface of the articles to be decorated or marked in preference to the surface of the transfer film, and consequently a design applied to the transfer film may be completely transferred therefrom.

The term "thermo-adhesive celluloid ink", as herein used, designates that class of quick-setting inks which are relatively non-penerating and dry by the evaporation of a volatile thinner or vehicle, or by the evaporation and/or oxidation of a suitable binder, and which after drying are rendered adhesive by heat. Such inks preferably comprise a maximum amount of pigment or other suitable coloring matter which

constitutes the body of the ink, sufficient thermo-adhesive binder to prevent dusting or flaking of the ink when dry, and a volatile thinner to insure sufficient fluidity or plasticity to permit the use of the ink in printing machines. The binder preferably comprises nitrocellulose with or without a suitable plasticizer, although it may include an oxidizable oil or the equivalent. I have found that plain regenerated cellulose is preferable to waterproofed regenerated cellulose, due to the fact that materials adhere less thereto. For certain effects, I find it desirable to spray or otherwise apply a film of pyroxylin lacquer to the surface of plain regenerated cellulose, and then print the design upon the film, subsequently transferring both in the manner hereinafter described to the surface to be decorated,—thus applying a design and a protective coating therefor in one operation. As the celluloid inks contain no active solvents, they may be applied to the transfer sheet by printing or lithographing according to the methods in use at present. I also contemplate the use of inks which dry or set by congelation and which may be applied in a fluid state to the transfer sheet by a rotogravure or lithographic machine.

One embodiment of the product aspect of the invention is shown in the accompanying drawing wherein:

Fig. 1 is a diagrammatic perspective view, on a greatly enlarged scale, of a transfer sheet made in accordance with the present invention;

Fig. 2 is a view similar to Fig. 1, showing a base or backing sheet adapted to receive the design carried by the transfer sheet;

Fig. 3 is a side elevation of a platen press, illustrating its use to effect the transfer of the design; and

Fig. 4 is a diagrammatic perspective view of the finished product.

Referring to Fig. 1, the transfer sheet, designated generally by the numeral 10, comprises a thin translucent film 11 of regenerated cellulose or the like material of the previously described character. A decoration or other desired marking, here shown as a design 14 simulating the skin of a reptile, is printed or otherwise applied to one side of the film 11, using a thermo-adhesive celluloid ink.

A base or backing sheet 15 of leather, or other material on which the design is to be applied, is preferably treated in any suitable manner to provide an improved surface which will receive the design more effectively and hence facilitate the transfer. To this end the surface of the sheet 15 may, if desired, be cleaned and then coated with a thin film 16 of nitrocellulose lacquer or the like material. However, it is permissible to dispense with this step, particularly where the surface of the article to be coated is of a character which will produce a satisfactory bond without any preliminary treatment.

The transfer sheet 10 is placed on the coated surface 16 of the leather 15 or article to be marked with its printed face 14 in contact therewith and in desired registered relation thereto. Due to the transparency of the film an exact positioning of the transfer sheet on the leather or other article is possible. The assemblage is then placed on the bed B of a steam heated platen press P, as shown in Fig. 3, and heat and pressure are then applied in the usual manner, whereupon the design, having a greater affinity to adhere to the surface of the leather or other article than to the surface of the transfer sheet is released and becomes transferred. The transfer sheet may then be easily peeled off without further treatment, leaving the design adhering to the article.

This operation may be performed by hand or carried out in a hot press as above described, in which case several layers of transfer sheets and articles to be decorated can be treated simultaneously. The heat and pressure applied should be high enough to cause the design to adhere to the article treated, but care should be taken to avoid temperatures which would injure or decompose either the article, the transfer sheet, or the ink, and also pressures which would cause deformation of the design. Suitable pressures are, for example from 250 to 1000 pounds per square inch, with a temperature of about 200° to 230° F. The heat and pressure need be applied only for a short time, usually less than a minute, unless several layers are treated simultaneously in a press, in which case the time of treatment should be sufficiently increased to effect a complete transfer of the designs from the transfer sheets.

After having transferred the design or decoration, it is desirable to apply one or more coats 18 of lacquer to the decorated surface to bring out the decoration and provide a protective layer thereto. Any suitable varnish or lacquer which will not obliterate or damage the design may be used and, if desired, the same may be dyed to harmonize with the particular decoration.

My process is particularly useful in connection with the decoration of leather and leather substitutes to provide designs simulating different animal skins, including reptilia. It is to be understood, however, that my process is not limited to any particular type of design or decoration and may be advantageously employed in applying any conventional mark, design, trade mark or the like to various materials such as paper, fiberboard, wood, textiles, and, in general, any article having a surface to which the ink will adhere in preference to the surface of the transfer sheet when subjected to moderate heat and pressure.

In this specification and in the appended claims, the words "design", "printing", "mark", and "decoration" and derivatives thereof are used reasonably interchangeably and refer to the impression placed upon the transparent sheet and transferred therefrom to the article under treatment.

I claim:

1. Process for decorating leather which consists in applying a design in a thermo-adhesive celluloid ink to an impenetrable relatively non-adhesive surface of a transfer sheet, superposing the transfer sheet on the leather, applying heat and pressure to cause the ink of the design to adhere to the leather, and removing the transfer sheet.

2. Process for decorating leather which consists in applying a design in a thermo-adhesive celluloid ink to a sheet of regenerated cellulose, superposing said sheet on the leather with the design toward the leather, applying heat and pressure to effect the transfer of the design from said sheet to the leather, and removing the sheet.

3. Process of decorating which consists in applying a design in a thermo-adhesive cellu-

loid ink adapted to dry by oxidation to an impenetrable relatively non-adhesive surface on a transfer sheet, transferring the design to a surface to be decorated by the application of heat and pressure, and removing the transfer sheet.

4. Process for decorating which consists in the steps of imparting a design in a thermo-adhesive celluloid ink to a transparent transfer medium, superposing the transfer medium on the surface to be decorated, transferring the design from the said medium to the said surface by the application of heat and pressure, and removing said transfer medium.

5. Process of applying a mark, design or the like to the surface of an article such as leather, paper, textiles, etc., which consists in forming said mark, design, or the like on the surface of a relatively non-absorbent, translucent transfer medium in a thermo-adhesive celluloid ink selectively adhesive to the surface of said article in preference to the surface of said transfer medium, superposing the transfer medium on the surface of said article, effecting the transfer of said mark, design, or the like by the application of heat and pressure, and removing said transfer medium.

6. Process for decorating which consists in the steps of imparting a design in a thermo-adhesive celluloid ink to a transparent transfer medium, placing the transparent transfer medium in proper registry with the surface to be decorated, transferring the design from the said medium to the said surface by the application of heat and pressure, and removing the said medium from the said surface.

7. A transfer sheet adapted for decorating leather, consisting of a sheet of regenerated cellulose having on its surface a design in a non-penetrating ink selectively adhesive to leather in preference to regenerated cellulose and transferable by the application of heat and pressure.

8. A transfer sheet adapted for decorating leather, consisting of a sheet of regenerated cellulose having on its surface a design simulating an animal skin, in non-penetrating ink, said design being transferable to a leather surface by the application of heat and pressure.

9. A transfer sheet of the character described consisting of a translucent film having a smooth, continuous and relatively non-absorbent surface, and a non-penetrating transferable mark thereon in a thermo-adhesive celluloid ink, said mark being transferable from said sheet to the receiving surface by the application of heat and pressure.

10. A transfer sheet of the character described consisting of a translucent film having a smooth, continuous and relatively non-absorbent surface, and a non-penetrating transferable mark thereon in a thermo-adhesive celluloid ink, said mark adhering to the surface of said film and releasable in response to the application of moderate heat to said film.

11. Process of applying a mark to the surface of an article which consists in applying a coating of lacquer to the surface of said article, superposing a transfer medium on the coated surface of said article, the transfer medium consisting of a film of cellulosic material having a smooth non-absorbent surface and a mark thereon in a thermo-adhesive celluloid ink selectively adhesive to the coated surface of said article in preference to the surface of said transfer medium, applying heat and pressure to effect the transfer of said mark from said medium to the surface of said article, and removing said transfer medium.

12. Process of decorating leather or the like material, which consists in applying a coating of lacquer to the surface of the leather, applying a design on the surface of a film of regenerated cellulose in a thermo-adhesive celluloid ink selectively adhesive to the coated surface of said leather in preference to the surface of said film, superposing said film on the coated surface of the leather with the design toward the leather, applying heat and pressure to effect the transfer of the design from said film to the leather, and removing said film.

13. A transfer sheet of the character described consisting of a translucent sheet of cellulosic material having a smooth, continuous and relatively non-absorbent surface, and a transferable mark or design thereon consisting of a thermo-adhesive celluloid ink adhering to the surface of said translucent sheet and being releasable therefrom in response to the application of moderate heat to the reverse side of said sheet.

14. A transfer sheet for applying a mark, design, or the like to the surface of an article such as leather, paper, cloth, etc., which consists of a film having a smooth, continuous and relatively non-absorbent surface, and a transferable mark or design thereon in a thermo-adhesive celluloid ink which is selectively adhesive to the surface of said article in preference to the surface of the film, said mark adhering to the surface of said film and being transferable therefrom to the surface of said article by the application of heat and pressure.

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