Patented Oct. 28, 1924. 1,513,370

UNITED STATES PATENT OFFICE

ERNEST CADGÈNE, OF ENGLEWOOD CLIFFS, AND JULES JEANDROS, OF PATERSON, NEW JERSEY; SAID JEANDROS ASSIGNOR TO SAID CADGÈNE.

SODA-PRINT PROCESS.

No Drawing. Application filed February 15, 1924. Serial No. 693,123.

To all whom it may concern:

Be it known that I, ERNEST CADGÈNE, a citizen of the Republic of France, residing at Englewood Cliffs, county of Bergen, and State of New Jersey, and I, JULES JEANDROS, a citizen of the United States, residing at Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Soda-Print Processes, of which the following is a specification.

This invention relates to the printing of textile fabrics to produce brocaded or raised figured effects. In textile printing such effects are produced by what is known in the industry as the "soda print" process, which consists in the destruction by burning or otherwise, treating with a suitable chemical certain portions or sections of the fabric, the foundation or backing fabric of which consists of threads of different fibre from the threads which form the covering, the foundation threads usually being of animal fibre, as for example, silk, and the other threads or threads to be destroyed, being of vegetable fibre, as for example, artificial silk or cotton. The fibres which constitute the threads of the foundation and the covering are obviously not limited to the example given, as silk may be used for the covering and any vegetable fibres for the foundation, or the entire fabric may consist of threads formed of the same fibres, having either the covering or foundation threads treated to resist the action of the chemical employed. The chemical is applied to the fabric usually by means of a printing roller provided with the required characteristics to produce the desired design, after which the fabric is subjected to heat to accelerate the reaction between the chemical and the threads to be destroyed. Obviously, a chemical is selected which will react with the threads to be destroyed, but which will be neutral with respect to the foundation threads. The reaction of the chemical with such threads is permitted to continue until the binding of certain of the threads to the foundation is destroyed and the fabric is then brushed, washed or otherwise treated to remove the loosened threads, from the foundation fabric, thus leaving the covering thread intact in the untreated portions to produce the raised figures.

While very beautiful and effective designs have been produced by the "soda print" process as heretofore carried out, such process has been limited in its application to the production of solid color effects, or two color effects obtained through dyeing of the different fibres, and as the desirability of producing vari-colored effects upon and in exact registry with the undestroyed or reserved figures and designs has long been recognized, many attempts have been made to combine color printing of designs with the soda print process. Such attempts, however, have not been very successful, because of the unsurmountable difficulty of securing proper registry of the color printing with the reserved figures of the fabric after the soda printing has been completed, and the equally great difficulty of simultaneously printing the fabrics with the burning or etching chemical and colors. While in the latter case it has been found possible to secure an accurate registration of the color and chemical during the printing, it has been found impossible to prevent the colors and chemicals from running.

It is the object of our invention to produce a new and improved soda printing process by means of which all of the reserved figured effects heretofore obtained may be secured and in addition any desired color effects may be produced upon the reserved figures; the color effects obtainable with our process being practically unlimited and the outlines of the colored designs upon such figures being produced accurately with any desired degree of sharpness or contrast.

In its broadest aspects, our process consists in printing the desired color effects and patterns upon the face of the fabric and mixing with the colors, a resist composition which is preferably colorless, and which will prevent the chemical used for destroying the threads to be destroyed from attacking or reacting with the threads of the portions to be reserved. The resist composition may either form a protective coating upon the reserved portions or may be such that it will react with the soda print chemical so as to neutralize the effect thereof. After the combined coloring and resist composition is applied, the entire face or back of the goods is then coated with the soda print chemical,

as for example, aluminum chloride or aluminum sulphate, when the threads to be destroyed consist of vegetable fibre. While the coating of the fabric with the soda print may be done in any suitable or convenient manner, we have found it desirable to use a padding roller the entire surface of which is covered with mille points, or as commonly termed in the art "petit points." The fabric is then subjected to heat, preferably by passing it through a dry box and as the soda print chemical will attack and react with all of the threads which have not been coated with the combined coloring and resist composition, the binding of such threads with the foundation fabric will be destroyed and will cause such threads to become loosened from the foundation so that they will either fall away from the foundation or may be readily removed therefrom by carding or brushing.

The usual manner of carrying out the well known "soda print" process is to execute the print upon the back or the face of the goods and is performed on the goods either: (*a*) when they are in the raw state, (*b*) when they are in the boiled off state; (*c*) when they are in the dyed state; or (*d*) after a regular print. As heretofore pointed out, it has been found a practical impossibility to secure a proper registration of the soda print design with the regular color print and to produce a commercially practical product. While our process can be performed upon the goods when in the raw, boiled-off or dyed state, the following is the preferred sequence of operations which we employ. The regular boil-off of the goods is performed, after which they are dyed, then the color printing of the goods as hereinbefore described by the use of a resist composition, is performed, and after the color printing has been completed the goods are steamed to fix the colors. The printed fabrics are now ready for the application of the burning composition or chemical which is applied evenly over the entire surface of either side of the goods, but preferably over the face thereof; after which the goods, with the chemical applied thereto, are subjected to the required heat to cause the unreserved threads to be destroyed as with the regular soda print. It will be obvious that the threads will only be destroyed upon those parts of the goods which have not been coated with the resist color compositions, used in the first printing. After the burning of the unreserved threads has been completed, the goods are then washed, brushed or otherwise treated, to remove the loose threads and the chemicals used in the soda print, and are then subjected to the regular finishing operations.

We have found that aluminum chloride, or aluminum sulphate, or a mixture of these two chemicals, is satifactory for performing the burning or etching of the goods; and a typical example of a composition successfully employed by us for the combined print and resist printing consists of a regular gum arabic printing color of any desired shade, to which is added 25 per cent of blood albumen, 7 per cent of chromium acetate and 5 per cent of sodium acetate. The albumen assists the coagulation of the compound and forms a waterproofing for the printed colors; the chromium acetate assists in the waterproofing and also acts to fix the colors; and the sodium acetate helps to protect the printed parts by neutralizing the burning effects of the aluminum compounds.

It will be understood that the combined color and soda print compositions may be varied considerably in accordance with the nature of the goods to be treated, and that the resist composition added to the regular printing color will obviously be varied according to the chemical employed for burning the threads to be destroyed.

Furthermore, the brocaded effects which may be obtained by the use of our process are not limited to a fabric containing animal and vegetable fibres as hereinbefore described, but the process is equally applicable to plain cotton fabrics, to cotton fabrics in which the entire fabric or either the foundation or covering is constructed of mercerized or other threads to resemble silk, or to fabrics constructed in whole or in part of any artificial silks, acetylated cellulose or otherwise, provided that the fibres of the threads which are to form the foundation of the fabric are treated with a protective chemical before weaving. It will thus be seen that our process may be carried out not only with fabrics constructed of threads of different species, but also with fabrics constructed of all cotton fibres; all animal fibres, or all vegetable fibres if one set of the threads has been treated with a protective chemical before weaving.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. The process of producing brocaded figured effects upon textile fabrics which consists in printing said fabrics with a printing color containing a resist composition and applying to the entire surface of one face of said fabric a coating of a chemical adapted to destroy the threads of said fabric which have not been treated with said resist composition.

2. The process of producing a brocaded effect upon a textile fabric which consists in printing said fabric with a printing color containing a resist composition and applying a substantially even coating to the entire surface of one face of said fabric, of a chemical adapted to destroy all of the threads of said fabric which have not been treated with

said resist composition whereby a colored raised figured effect will be produced on said fabric.

3. The process of producing a brocaded effect upon a textile fabric which consists in printing said fabric with a printing color containing a resist composition and applying a substantially even coating to the entire surface of one face of said fabric, of a chemical adapted to destroy all of the threads of said fabric which have not been treated with said resist composition, then subjecting said fabric to heat to accelerate the reaction between said chemical and threads to be destroyed, whereby a colored figured effect will be produced on said fabric.

4. The process of producing a brocaded effect upon a textile fabric which consists in applying a printing composition to the threads of said fabric to produce a colored ornamental design thereon, and then applying an even coating to the entire surface of one face of said fabric, of a chemical which will react with the unprinted portions of said threads to destroy the binding thereof to said fabric, said printing composition containing a resist which will prevent said chemical from reacting with said threads.

5. The proceeds of producing a brocaded effect upon a fabric which consists in applying a printing composition to the threads of said fabric to produce a colored ornamental design thereon, and then applying an even coating to the entire surface of one face of said fabric, of a chemical which will react with the unprinted portions of said threads to destroy the binding thereof to said fabric, said printing composition containing a resist composition, which will form a resistive coating upon said threads and which will neutralize the effect of said chemical upon said threads whereby the destruction of such threads as are treated with said printing composition will be prevented.

6. The process of producing brocaded effect upon a fabric which consists in applying a printing composition to the threads of such fabric to produce a colored ornamental design thereon, applying a substantially even coating to substantially the entire surface of one face of said fabric, of a chemical adapted to react with the threads of said fabric and destroy the binding thereof to said fabric, said printing composition, including a compound to produce a waterproof coating upon said threads, a compound to increase the waterprofing effect and fix the colors of said printing composition, and a compound to neutralize the destructive effect of said chemical, whereby the destructive action of said chemical upon the printed portions of said fabrics will be prevented.

7. The process of producing a brocaded effect upon a fabric which consists in printing said fabric with a colored printing composition to form an ornamental design, applying a substantially even coating to the entire surface of one face of said fabric, of a chemical which will react with the fibres of the threads of said fabric to destroy the binding of said threads with the foundation of the fabric, and then subjecting the fabric to the application of heat to accelerate the reaction of said chemical with said threads, said printing composition containing a resist composition which will resist the action of said chemical during the heat treatment of said fabric and will prevent said chemical from reacting with the threads which have been printed with said ornamental design.

8. The process of producing brocaded effect upon a fabric which consists in applying a printing composition to the threads of such fabric to produce a colored ornamental design thereon, applying a substantially even coating of an aluminum compound to substantially the entire surface of one face of said fabric, then subjecting said fabric to the application of heat to cause said aluminum compound to react with and destroy the threads of said fabric which have not been coated with said printing composition; said printing composition containing a resist composition which will prevent said aluminum compound from reacting with the threads which have been printed with said ornamental design.

9. The process of producing a brocaded effect upon a fabric which consists in applying a printing composition to the threads of such fabric to produce a colored ornamental design thereon, applying a substantially even coating of an aluminum compound to substantially the entire surface of one face of said fabric, then subjecting said fabric to the application of heat to cause said aluminum compound to react with and destroy the threads of said fabric which have not been coated with said printing composition; said printing composition containing a compound to produce a waterproof coating upon said threads, a compound to increase the waterproofing effect and to fix the colors of said printing composition and a compound which will neutralize the effect of said aluminum compound and prevent the destructive effect thereof upon the printed portions of said fabric.

10. The process of producing brocaded effects upon textile fabrics which consists in printing an ornamental colored design upon the surface of said fabric with a printing composition containing blood albumen, chromium acetate, and sodium acetate; applying a substantially even coating of an aluminum compound to substantially the entire surface of one face of said fabric, and then

subjecting the fabric to heat to cause said aluminum compound to react with unprinted portions of the threads of said fabric, whereby the binding of the unprinted threads with the foundation of the fabric will be destroyed and a raised figured design will be produced.

11. The process of producing a brocaded effect upon a textile fabric formed of a foundation cloth and a covering secured thereto, which consists in treating the fibres of the threads which form the foundation cloth with a protective chemical before the weaving of said fabric, then printing a design upon the woven fabric with a chemical which will react only with the threads which have not been treated with said first named chemical and destroy the binding thereof to said foundation cloth.

12. The process of producing a brocaded effect upon a textile fabric formed of a foundation cloth and a covering secured thereto, which consists in treating the fibres of the threads which form the foundation cloth with a chemical containing a resist before the weaving of said fabric, then printing a design upon the woven fabric with a colored printing composition containing a resist and applying a substantially even coating to the entire surface of one face of said fabric, of a chemical which will react with and destroy only the threads of said fabric which have not been treated with said first named chemical or said printing composition.

In testimony whereof we have affixed our signatures.

ERNEST CADGÈNE.
JULES JEANDROS.