

(No Model.)

F. SCHREURS.

PROCESS OF PRINTING AND DYEING FABRICS.

No. 576,623.

Patented Feb. 9, 1897.

Fig. 2.

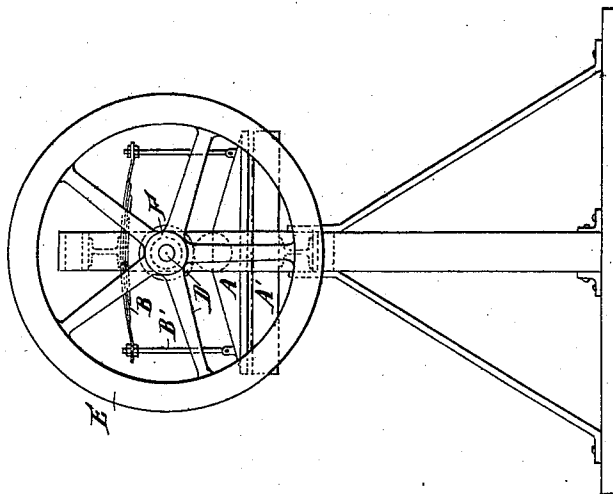
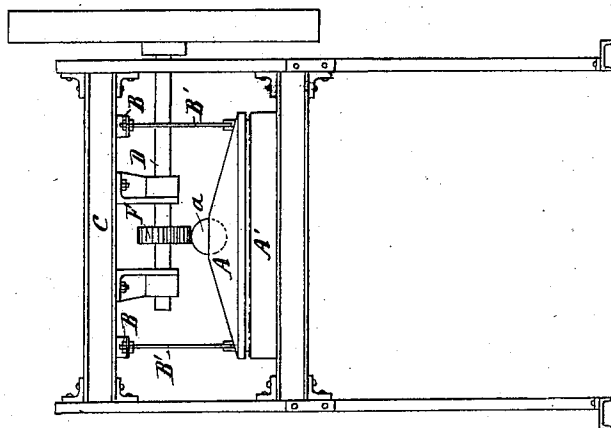


Fig. 1.



Witnesses

A. J. Hadden
H. E. Barrett

Inventor

François Schreurs
by A. J. Hadden
his Attorney.

UNITED STATES PATENT OFFICE.

FRANÇOIS SCHREURS, OF BRUSSELS, BELGIUM.

PROCESS OF PRINTING AND DYEING FABRICS.

SPECIFICATION forming part of Letters Patent No. 576,623, dated February 9, 1897.

Application filed December 7, 1895. Serial No. 571,410. (No specimens.) Patented in Belgium June 18, 1892, No. 100,158; in Germany June 22, 1892, No. 70,428, and in England October 24, 1892, No. 19,079.

To all whom it may concern:

Be it known that I, FRANÇOIS SCHREURS, a subject of the King of Belgium, residing at Rue de l'Enseignement, Brussels, Belgium, have invented a certain new and useful Process of and Apparatus for Printing and Dyeing Fabrics, (for which I have obtained Letters Patent in Germany, No. 70,428, dated June 22, 1892; in Belgium, No. 100,158, dated June 18, 1892, and in England, No. 19,079, dated October 24, 1892,) of which the following is a specification.

The process comprised in my invention consists in causing coloring-matter to penetrate the fabrics required to be dyed, by passing it through a stencil-plate or pattern of suitable material in order to produce on the fabric the design required. This penetration of the coloring-matter is produced either by pressure of a felt roller charged therewith or by pressure applied to a sheet of felt charged with the coloring-matter and stretched over or under the fabric, the felt roller or the sheet of felt being separated from the fabric by the stencil-plate.

Instead of felt other spongy material may be used, but for convenience of description I will assume that felt is the material used. The stencil-plate, which is the main feature of this invention, consists of a gelatin film or pellicle adhering to a tulle support suitably stretched over a frame. The permeability of this gelatin film or pellicle, which is interposed between the fabric and the felt, allows the coloring liquid, wherewith the felt is to be impregnated, to penetrate the fabric on the other side of the film, when by means of pressure suddenly applied and immediately removed the felt is compressed on the film and on the fabric, or, when the fabric is compressed, upon the film and the felt. According to the degree of permeability of the film a greater or less quantity of liquid will obviously be supplied to the fabric, that is to say, if in some parts the gelatin is entirely dissolved the coloring liquid will pass without obstruction and impart to the fabric the maximum amount of color, while at the same time a less quantity will pass into the parts where the gelatin is interposed. Moreover, if the film of gelatin be rendered more or less im-

permeable in certain places the different degrees of permeability at the different parts will produce corresponding differences of intensity of coloration of the fabric at parts. 55

It will be understood that if the gelatinized tulle is previously impregnated with a certain quantity of bichromate of potash and is exposed after drying to the light behind any suitable design, or a photographic plate, for instance, the light acting upon the gelatin thus prepared will produce therein different degrees of insolubility at different parts, according to the quantity of light which has passed through the different parts of the design. The gelatin film or pellicle thus obtained will serve as a stencil in which the design consists of portions of various degrees of permeability. Owing to the said film being supported by the tulle, it will retain its form and proportions, which is of importance in order that correctness of junction of the several parts of the design may be obtained where the dyeing is effected by means of several colors with the aid of several films or stencils applied successively upon the fabric. 65 70 75

The preparation of the gelatin need not be specially mentioned here unless it be stated that the use of coloring-matter heated to a high temperature requires the addition to the solution of a quantity of chrome-alum to avoid the dissolution of the parts which have not been transformed by the action of light. This precaution is, however, unnecessary when the designs are formed of lines, as in such cases it is not required to obtain different degrees of permeability, but only soluble and insoluble parts. 80 85

The mode of printing consists in covering the gelatin with felt impregnated with liquid tinctorial matter. The gelatin thus covered is laid upon the fabric required to be dyed and the whole is placed under the platen of a percussion-press of special construction hereinafter described. The pressure being suitably regulated, the felt is compressed, so that the liquid contained in it passes through the stencil-film and enters the fabric. This mode of printing may likewise be used with stencils formed of sheets of paper, metal, or other suitable material out of which the design to be reproduced has been cut. Woven 90 95 100

materials, such as lace, and other analogous material may also be used as stencils, provided the fibers of these fabrics be rendered impermeable.

5 Independently of the graduations of tints or shades which may be obtained according to the different degrees of permeability of the gelatin, or according as the lines are more or less separated, differences in the intensity of
10 the color for different degrees of compression of the felt may also be obtained by forming, for instance, reliefs or protuberances under the upper platen of the press, which reliefs or protuberances cause the pressure upon the
15 corresponding parts of the felt to be increased in proportion to their height, whereby the fabric is supplied with a greater quantity of coloring-matter, and hence a deeper shade or tint is imparted thereto at the parts on which
20 the reliefs press. On the other hand, the use of gelatin stencils allows of corrections or modifications being made after the exposure to sunlight, either by means of cyanid of potassium or of caustic potash, when greater
25 permeability is required to be imparted to too-exposed parts; or by means of nitric acid for the purpose of reducing the permeability. The whole of these combinations form the new
30 process which is comprised in this invention, which process admits of the printing of all kinds of designs upon any given fabric by means of liquid dyes.

Before describing the mechanical means which I use in order to produce the required
35 compression for carrying my process into practice I will remark that however intense may be the pressure, if the same be followed by a slow and gradual release, as occurs with presses in general use, the desired result will
40 not be attained, for if felt impregnated with a colored liquid be covered with a dry fabric and pressure be exerted thereon, even to an extent sufficient to destroy the felt, the surface of the fabric in contact with it will not
45 be colored, the only effect produced being the squeezing of the liquid out of the felt. On the contrary, if the fabric be suddenly compressed by a vigorous blow and released immediately afterward the fibrous cells of the
50 fabric, after the air has been driven out of them by the sudden compression, will return to their former state when the compression ceases and produce an exhausting action, when the liquid molecules, which are momentarily contracted by the shock or blow,
55 will, in consequence of their small compressibility, quickly occupy the vacant space and the fibers of the dry fabric will be impregnated with the colored liquid. It is on this
60 principle that the mechanical means which I am now about to describe for carrying out my invention are based.

In the accompanying drawings, Figures 1

and 2 show a platen press used in the carrying out of my process upon small-sized work.

The upper platen A of the press is suspended from a cross-bar C by means of two rods B' B', secured to springs B B, which have a constant tendency to raise said platen A, which is strengthened by means of cross-ribs upon its upper surface. At the point of intersection of these ribs, at the middle of the platen, a cup or socket is formed in which is placed a steel ball or sphere *a*. Above the platen is conveniently arranged a horizontal shaft D, carrying a fly-wheel E and a steel cam F, which bears on the ball or sphere *a*, the eccentric part of which cam causes the platen A to descend at each revolution of the shaft D, while the springs B raise the same instantly after the compression has taken place. The object of the sphere or ball *a* is to reduce the frictional strain of the cam. The felt impregnated with the coloring-matter may be arranged upon the inner surface of one of the two platens and may be made to adhere to the fixed or to the movable part of the apparatus. It may, for instance, be secured to the upper platen and be raised and lowered therewith. Moreover, the whole surface of the platen need not be covered with felt. The latter may be arranged on the platen only at the parts corresponding to the designs, and each surface or part of the platen provided with felt may form a special and independent organ, acting separately, like a hammer. Instead of so arranging the apparatus that the shock or blow may be produced downwardly, it may be arranged for the blow to be imparted upward or horizontally, or obliquely, or in any other direction. Instead of these mechanical means I may simply use hand labor by aid of wooden hammers taking the place of the upper platen A.

I claim as my invention—

The method of printing and dyeing fabrics consisting in forming a stencil of sensitized gelatin on a tulle support, the gelatin being dissolved away in the parts which are required to be open and being rendered permeable to various degrees according to the depth of the shade required to be communicated to the various parts of the fabric, applying said stencil to the fabric, applying to the back of the stencil a spongy material charged with the coloring liquid and causing said liquid to pass through the stencil and impregnate the fabric by pressure forcibly applied and immediately removed.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANÇOIS SCHIREURS.

Witnesses:

GEORGE BEDE,
GREGORY PHELAN.