

# UNITED STATES PATENT OFFICE.

WILLIAM PARSONS, OF LOWELL, MASSACHUSETTS, ASSIGNOR OF PART OF HIS RIGHT TO WILLIAM AND JAMES HARLEY, OF SAME PLACE.

## IMPROVEMENT IN PROCESSES OF ORNAMENTING HOSIERY AND OTHER KNIT FABRICS.

Specification forming part of Letters Patent No. **180,628**, dated August 1, 1876; application filed July 24, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM PARSONS, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Dyeing and Printing Knit Fabrics and articles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same.

Heretofore hosiery has been ornamented by embroidery with colored threads, so as to produce various figures. This is liable to wear off, on account of the colored portions being raised. It is also expensive to apply. Various stains have also been applied by stencil and stamp. The objection to these processes is that the color is not fixed upon the hose or stocking.

Now, my invention consists in applying various colors, so as to fix them permanently upon the fabric, the same as in dyeing or calico-printing; but as the dyes are fixed upon the cloth or stocking after it has been made, or least cut out, and the knit web is so elastic that it could not be dyed in the piece by means of the ordinary calico-printing machine and dye-bath, it is, therefore, necessary to resort to the process of steam or topical printing and dyeing with the class of colors that can be applied and fixed upon the fabric by that method.

In steam or topical dyeing and printing, the colors—such as alizarine, madder extract, or some pure dye-stuff of the madder class, or some one of the aniline colors—are mixed with the proper mordant, and then applied by blocks, stamps, dies, or rollers, and then placed in a steam-chest, so as to develop and fix the color due to the dye-stuff and mordant. By varying the mordants, a large number of different colors and shades may be obtained from a single dye-stuff. By several printings of different dye-stuffs of the kinds applicable to steam-dyeing, the number may be still further increased.

Another mode of applying steam or topical printing is to first print upon the fabric the different mordants, and then print upon the mordants the prepared dye-stuff in the form of paste, and then place in the steam-chest to de-

velop and fix the colors. With elastic fabrics, such as compose knit goods and hosiery, the ordinary calico-printing machine could not be applied, as the mordants and colors could not be made to register with each other.

By my invention I produce upon hosiery and knit goods, by alizarine, madder, and aniline colors, singly or combined, all the fine effects that are produced upon woven fabrics by the calico printer and dyers, all fixed upon the goods, so that they may be washed the same as woven fabrics, when once printed in fast colors.

My invention, therefore, consists in fixing upon hosiery or knit fabrics alizarine, madder, and aniline colors, or other fast dyes, single or combined, by means of steam dyeing and printing.

The following description will enable others skilled in the art to use my invention.

I take hose, stockings, gloves, or any knit fabrics suitable for forming those articles, either bleached, unbleached, or colored, as desirable, and print upon it, by blocks, dies, or rollers of the proper design, the suitable mordants and prepared dyes or dye, as used in steam and topical dyeing and printing, the mordants being either mixed with the dye and applied together, or applied one after the other. The goods thus prepared are then placed in the steam-chest, such as used in steam-dyeing, and the colors developed, fixed, cleared, soaped, washed, dried, and otherwise treated, as in steam-printing when applied to woven fabrics.

The preparing of the dyes and mordants, so as to produce any desired color, constitutes a large part of the dyer and calico-printer's art, and need not be explained here, as it can be understood with this explanation and what is known by every one skilled in the application of alizarine, madder, and aniline colors. The composition of the mordants and dye-pastes vary with the materials upon which they are to be fixed, whether cotton, wool, flax, silk, or other fiber. These modifications are also understood by those skilled in the art, and need not be further explained.

Suitable methods for combining madder-colors (under which is included artificial alizarine

or anthracene colors) with aniline colors are given in the Patent of James Harley, October 19, 1875, No. 168,991, and November 30, 1875, No. 170,620, care being taken to modify the process, as above explained, so as to make them applicable to elastic or knit goods.

When only the madder and alizarine colors, or the aniline colors, are to be applied, the ordinary methods of steam and topical printing may be used, with the modification, as above explained, in reference to the difference in printing upon knit fabrics.

The artificial alizarine and the aniline colors, from their uniformity and highly-concentrated condition, have made steam and topical dyeing and printing available in practice within the last few years. My invention of applying those colors renders their application practical to printing and dyeing knit fabrics by the steam-process.

For a chocolate with alizarine, or the equivalent in madder-dyes, the following formula will give a good result: Take four gallons water, four gallons starch, sixteen gallons alizarine, half-gallon olive-oil, half-gallon chloride of lime. When cold, add one gallon acetate of chrome. Apply this to the goods, as above explained, and steam for one or two hours.

A suitable apparatus for steaming consists of an endless woolen blanket, which enters and delivers from a square box, which contains steam at from two to five pounds pressure to the square inch above atmospheric pressure. The articles are held upon the blanket by

small hooks. The time during which the steam must act will depend upon the particular dyes applied, as some may be fixed in a shorter time than others.

The blocks and dies may be of any ornamental designs, such as stripes, checks, wreaths, vines, imitations of embroidery, flowers, and lace-work, or any other form or figure. The design is fixed upon the fabric or article the same as in dyeing and printing in fast colors.

I do not claim any of the means to be employed in forming designs, tracery, or printing; nor any part of the general process of preparing alizarine or aniline dyes, or fixing them upon fabrics, as they are known; nor do I limit myself to the exact details, as an expert chemist and dyer may readily suggest variations which are equivalent for some of them; but

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

The process of producing ornamentation upon hosiery and other knit goods, which consists in dyeing the same thereon, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM PARSONS.

Witnesses:

FREDERIC T. GREENHALGE,  
LOUIS H. KILESKI.