UNITED STATES PATENT OFFICE.

LOUIS B. FORTNER, OF PHILADELPHIA, PENNSYLVANIA.

PROCESS OF FIXING OR SETTING THE COLORS OF DYED FIBERS AND FABRICS.

No. 852,943. Specification of Letters Patent. Patented May 7, 1907.

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To all whom it may concern:

Be it known that I, LOUIS B. FORTNER, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented a certain new and Improved Process of Fixing or Setting the Colors of Dyed Fibers and Fabrics, of which the following is a specification.

My invention relates to the art of fixing the colors of dyed fibers and fabrics, and consists in subjecting such fibers and fabrics, after they have been dyed, to the action of a liquid that will positively set their color and thereby prevent bleeding of the same.

My invention is particularly adapted for use in setting or fastening certain dyes and colors on the fibers and fabrics, especially those colors of the direct dyeing class, such as the benzidine and diamin products, and the disazo and polyazo colors which contain meta-diamins and resorcin. Such fibers and fabrics when treated in accordance with my process will not wash off or bleed into the white or lighter color fibers or fabrics with which they may be combined after manufacture, when wetted or washed together. My improved process and the compound used in carrying out such process are especially applicable to certain of these dyes that have heretofore been unstable in this respect. I refer particularly to the direct dyeing blacks.

My invention consists essentially in subjecting the dyed fibers or fabrics to the action of formaldehyde (CH_2O), the latter being either in a gaseous or saturated form and being used alone or combined with an alkali or alkaline salts; either in a hot or cold state, and the treatment being conducted in such manner, and for such a length of time as particular circumstances may require. It is essential that the fiber or fabric operated upon shall be thoroughly impregnated by the formaldehyde. I have discovered that the formaldehyde treatment will fasten and develop the color of dyed fibers and fabrics, such chemical effecting the condensation of the coloring matter upon the fibers and fabrics, at the same time rendering inert any loose color; thereby greatly increasing the fastness of the color of the goods and effectually preventing its washing away or bleeding into the white during any subsequent washing operations to which the fibers or fabrics may be subjected.

In carrying out my improved process, I take fibrous material, such as cotton, woolen or silk yarn, in the skein, hank or warp, or any fabric composed of such fibrous material all of which has been previously dyed with one or more of the benzidine series of colors, say for instance, black, to which my process is particularly applicable. I take such material in any convenient quantity, wet from the dye bath and then give it an after-treatment of formaldehyde at a temperature of 130° F, for about 30 minutes. This bath is preferably made up in the following proportions, viz.: sufficient water is used to cover the goods in the tank or other receptacle in which the operation is carried out, and to this bath a quantity of formaldehyde (of commercial 40% strength), equal to about 2% to 4% of the weight of the goods is added. It is not absolutely necessary that the bath be heated, and the process may be carried out at a much lower temperature, the only difference being that the goods must remain in the bath of lower temperature for a longer time. This is not altogether objectionable, however, since the vaporization of formaldehyde, which is volatile, takes place slowly at the lower temperature.

I have also found in carrying out my invention, that under certain conditions it is advantageous to add an alkali to the solution of formaldehyde. For this purpose I may use potash or caustic soap, carbonate of potash or carbonate of soda, caustic potash or caustic soda, or any other suitable alkaline substance. The addition of an alkaline substance to the formaldehyde, serves to render the latter less volatile, and at the same time the combination of the alkali with the formaldehyde assists the latter to fix and cleanse the color. For commercial purposes, the addition of the alkali diminishes vaporization and lessens the loss of formaldehyde during shipment.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. The herein described process of fixing the colors of dyed fibers and fabrics, which consists in subjecting the dyed fibers or fabrics while in a wet condition to the action of formaldehyde (CH_2O), substantially as herein set forth.

2. The process of fixing the colors of dyed fibers and fabrics, which consists in subjecting while in a wet condition the fibers or fabrics whose colors are to be fixed to the action of formaldehyde (CH_2O) employed in solution, substantially as set forth.

3. The process of fixing the colors of dyed

fibers or fabrics, which consists in subjecting while in a wet condition the fibers or fabrics whose colors are to be fixed, to the action of formaldehyde (CH_2O) in solution, in combination with an alkali, substantially as set forth.

4. The process of fixing the colors of dyed fibers and fabrics, which consists in subjecting while in a wet condition the fibers or fabrics whose colors are to be fixed to the action of formaldehyde (CH_2O) in solution, in combination with potash soap, substantially as set forth.

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

LOUIS B. FORTNER.

Witnesses:

MURRAY C. BOYER,

JOS. H. KLEIN.