United States Patent Office.

WILLIAM H. SALISBURY, OF LAWRENCE, MASSACHUSETTS.

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IMPROVED PROCESS FOR THE PREPARATION OF WOOLLEN CLOTHS FOR DYEING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM H. SALISBURY, of Lawrence, in the county of Essex, and Commonwealth of Massachusetts, have invented a new and improved Process for the Preparation of Woollen Cloths for Dyeing; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in a peculiar method of boiling cloths, or woven fabrics of wool, or of wool mixed with cotton or other fibre, commonly called Union cloths, preparatory to their being dyed. The invention may also be applied to other fabrics.

It is well known that many if not all woollen or Union cloths, in the process of manufacture, when the object is to dye them in the piece, after having been scoured, and before the application of the dye, are subjected to a process of boiling. The object of the boiling is to open the pores of the fibre, the boiling-process giving more lustre to the fibre, and making the color more intense, so as to admit the coloring-matter to its interior.

The mode of boiling invariably pursued heretofore, so far as my observation has extended, is as follows: The cloth is wound very firmly around a cylinder, great importance being attached to the firmness and solidity with which the roll is made, the cloth being wound upon the cylinder as firmly as it can be without rupturing it. The winding of the cloth, to give it the requisite tension, involves the compactness of the roll, which prevents the equal action of the boiling water. The roll of cloth thus formed is usually placed vertically in the boiling-vessel, and frequently changed, end for end, and sometimes it is placed in the vessel horizontally; but, in all cases, the compactness of the roll is insisted upon as a feature of the highest importance in the boiling-process.

I have found, by observation of a vast number of pieces of cloth treated in the manner above described, that such cloths, upon being dyed, are wanting in uniformity of shade throughout the piece. The ends of the piece, and the outside portions, exhibit different shades from the interior portions, although of the same general color, this variation of shade giving an aspect of cloudiness to the piece. My observations have led me to conclude that this cloudiness and unevenness of dye is due solely to the inequality of the action of the boiling water or steam upon the cloth during the process above described, in consequence of the manner in which the cloth is rolled, and that the remedy is to be sought by completely reversing the method heretofore pursued.

The process which I usually adopt is as follows:

I provide a boiler or boiling-box, suitably constructed for holding water, and so arranged that the water may be brought to the requisite temperature by fire beneath it, or by the admission of steam, and long enough to receive two cylinders of sufficient length to wind the cloth to be folded around them, and deep enough that the cloth-cylinders may be covered with water.

Each cylinder is constructed so as to revolve upon a journal, extending through the box, to a stuffing-box outside of the same, and suitable power is attached to each cylinder, for revolving the same.

One end of the piece of cloth to be boiled is attached, in any suitable manner, to one cylinder, and wound around it, and the other end of the piece of cloth to the other cylinder, the cloth being kept in a suitable state of tension.

A space is left between the two cylinders, so that the cloth, in passing from one to the other, shall be freely exposed, upon both of its surfaces, to the action of the boiling water or steam, in which they are completely immersed.

The cylinders are revolved, by suitable mechanical devices, in such a manner that the cloth is wound upon one cylinder as it passes from the other cylinder.

The motion is then changed, the cloth passing to the cylinder from which it was before unwound.

During this alternate motion of the cloth from one cylinder to the other, successive portions of the cloth between the cylinders are continuously freely exposed, at both their surfaces, to the action of the boiling water or steam. By this means, the whole of the cloth is equally boiled.

Although the process, above described, of passing the cloth from one cylinder to the other, is peculiar to myself, and is the most convenient which I have found for accomplishing my purpose, I do not limit myself to any one mechanical device for exposing the surfaces of the cloth equally to the action of the boiling water. This equal exposure of both surfaces of the whole piece of cloth, while in a state of tension, to the action of boiling water, as distinguished from the old methods of compacting the cloth in rolls, where the action of the boiling water is necessarily unequal, constitutes the principle of my process. It is obvious that the object which I accomplish may be effected by various equivalent means, such as stretching the cloth vertically or horizontally, so that both surfaces may be equally exposed to the action of the boiling water when completely immersed in it.

I have found, by experiment, that the cloth boiled by my process is not only more evenly dyed, but that the time consumed in boiling is not more than a quarter as long as in the old process, thus effecting both an improvement and economy in the manufacture.

What I claim as my invention, and desire to secure by Letters Patent, is—

In the preparation of cloth for dyeing by boiling, the exposure of both surfaces of the cloth, while in a state of tension, and submerged, in a suitable vessel, freely and equally to the action of boiling water or steam, in the manner above described, or by any equivalent means of producing that result.

WILLIAM H. SALISBURY.

Witnesses:

ALF'D P. CLARK,

PARKER C. KIRK.