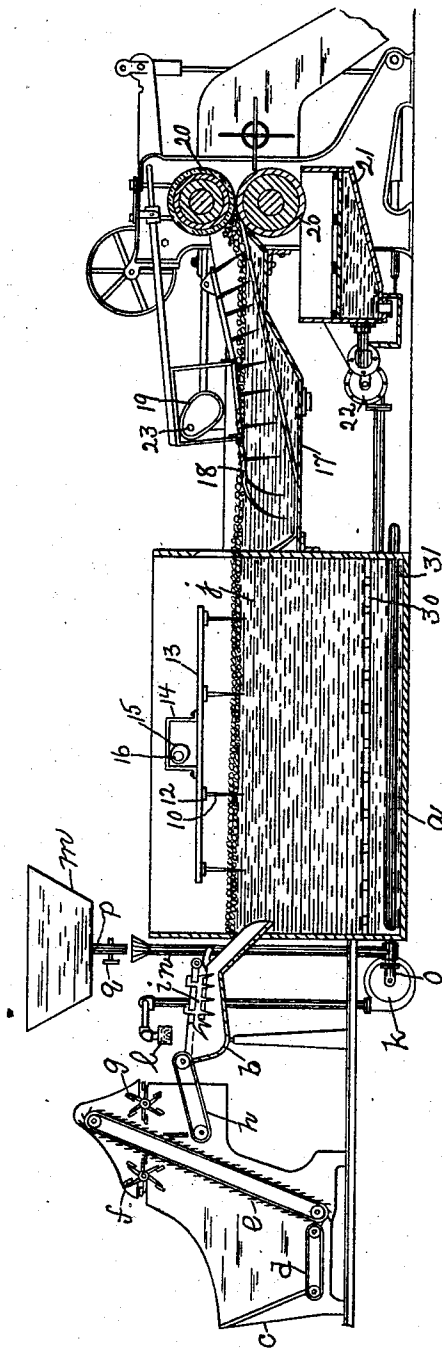


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W. J. McCONVILLE.
PROCESS OF DYEING RAW STOCK.
APPLICATION FILED APR. 10, 1902.

NO MODEL.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM J. McCONVILLE, OF LAWRENCE, MASSACHUSETTS.

PROCESS OF DYEING RAW STOCK.

SPECIFICATION forming part of Letters Patent No. 718,651, dated January 20, 1903.

Application filed April 10, 1902. Serial No. 102,243. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM J. McCONVILLE, a citizen of the United States, residing in Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in Methods of Dyeing Raw Stock, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a novel method with which animal and vegetable fibers in their raw state and in a loose condition may be uniformly dyed, especially in light shades, in a minimum time and at a minimum expense.

The invention is an improvement upon that method of dyeing in which the raw stock in substantially small quantities in a loose condition is subjected to the action of the dye liquor in a basin or trough from which it is fed into cylinders having compartments provided with foraminous walls and revolving in a vat containing the dye liquor, substantially such as shown and described in United States Patent No. 663,012, dated December 4, 1900. With the apparatus shown in the patent referred to the dye liquor is maintained in circulation by a pump, which takes the liquor from the vat and discharges it into the basin or trough and the dye liquor is replenished and its strength maintained by the admission of fresh dye liquor into the dye-vat.

The present invention has for its object to avoid uneven dyeing of the raw stock caused by contact of the fresh dye liquor with some portions of the stock and not with others, resulting from the admission of the fresh dye liquor into the vat. For this purpose I provide for admixing the fresh coloring-matter or dye liquor with the weaker liquor extraneous to the main vat and preferably effect this result by connecting the liquor-supply tank or vessel with the circulating-pump at its suction side, so that the fresh liquor in predetermined quantities may be thoroughly admixed with the weaker liquor drawn from the dye-vat and the resultant liquor of the desired or required strength brought into contact with the raw stock in the auxiliary vessel or basin, in which the said stock is thor-

oughly saturated with the dye liquor, thus insuring the raw stock being dyed uniformly, which is especially advantageous in light shades. These and other features of this invention will be pointed out in the claims at the end of this specification.

The drawing represents in section and elevation a sufficient portion of an apparatus with which to practice this invention.

Referring to the drawing, *a* represents the dye-vat, which may be of any usual or suitable construction, with which communicates the receptacle, basin, or trough *b*, into which latter the loose fiber or raw stock is fed from the hopper *c* by mechanism which may be such as shown and described in the patent referred to, and comprises, essentially, the endless apron *d*, the lifting-apron *e*, the knock-off roll *f*, the doffer-roll *g*, and the endless apron *h*, which latter deposits the raw stock in a continuous manner in substantially small quantities into the basin or trough *b*, where by means of the rake *i* the raw stock is carried forward into the vat *a*. The vat *a* contains the dye liquor *j*, which flows into it from the trough *b* and is drawn off from the vat by the pump *k* and is discharged through the rose or sprinkler *l* into the basin or trough *b* near the inlet end of the same and upon the loose fiber or raw stock as the latter is deposited in the basin or trough *b* by the feed-apron *h*. The rake *i* may be given a four-motion feed, and the feed mechanism for the loose fibers may be operated after the manner represented in the patent referred to. In accordance with this invention the dye liquor is replenished by fresh liquor from a suitable source of supply (shown as a tank *m*) by means of a pipe *n*, connected, preferably, with the suction or inlet pipe *o* of the pump *k*, the pipe *n*, as represented, being separate from the outlet-pipe *p* of the supply-tank *m*, which latter is provided with a cock or valve *q*, by which the quantity of fresh liquor may be regulated so as to maintain the particular shade or color desired by admixing the fresh dye liquor with the weakened dye liquor extraneous to the vat *a*. The resultant liquor is brought to the standard or desired degree of strength prior to its being discharged upon the substantially small quantity of raw stock which is continuously fed into the basin or

trough *b*, in which the raw stock being in its open condition absorbs the coloring-matter or dye liquor in a uniform manner, and the dyeing is completed in the vat *a*, in which the fiber in a loose state floats in the liquor and is fed in a continuous manner through the said vat in any suitable manner—as, for instance, by means of the rake herein shown, which comprises fingers 10, depending from cross-bars 12, which are suitably fastened to longitudinal bars 13, the latter having secured to them suitable frames 14, which are adapted to be engaged by cams 15 on a shaft 16, suitably supported outside of the vat and driven in any suitable manner. The cams 15 in their rotation engage the frames 14 and produce a substantially four-motion feed of the rake, thereby feeding the loose stock through the vat *a* and into the basin or trough 17, wherein the dyed stock is engaged by a second rake 18, having a four-motion feed movement imparted to it by the cam 19, which motion carries the dyed stock to the squeezing-rolls 20, by which the surplus dye liquor is expressed from the raw stock and descends into a suitable trough 21, from which it is returned to the dye-vat *a* by the pump 22, which latter may be of any usual or suitable construction.

The shaft 23, carrying the cams 19 and the squeezing-rolls 20, may be rotated in any suitable manner.

The vat *a* may be provided with the usual false bottom 30 and heating-pipes 31.

By the method herein described a mass of raw stock may be dyed of a uniform shade and in a continuous manner by reason of the fact that the standard or strength of the dyeing liquor is obtained and maintained by admixing fresh dye liquor with the weakened liquor drawn from the dye-vat at a point which is extraneous to the said dye-vat and discharging the resultant liquor of standard strength upon a substantially small amount of the raw stock, whereby the latter may become thoroughly and completely impregnated with the solution of a standard strength extraneous to the dye-vat. By means of the valve *g* the amount of fresh liquor which is admixed with the weakened liquor from the dye-vat may be regulated to a nicety, so as to maintain the resultant or dyeing solution of a standard strength and to obtain the desired shade or color on the stock. This is

especially advantageous in the case of raw stock which it is desired to dye with a light shade, inasmuch as any difference in the depth of color is more marked in the case of materials dyed with a light shade than with a deep or heavy shade.

By means of the method herein described I not only obtain a uniform dyeing of the raw stock, but I also am enabled to effect this result in a minimum time and at a minimum expense without the aid of rotatable baskets or cylinders such as shown in the patent referred to, as the fiber may be maintained in its loose condition in the dye-vat on its passage through the same.

I claim—

1. The method of dyeing raw stock, which consists in subjecting substantially small amounts of the raw stock prior to its entrance into the dye-vat to the action of a dyeing liquor of a predetermined or standard strength, discharging the stock thus treated together with the dye liquor thus used into the dyeing-vat, circulating the dye liquor through the dyeing-vat, admixing outside of the vat a predetermined quantity of fresh dye liquor with a portion of the dye liquor withdrawn from the vat and while in circulation, and subjecting a fresh quantity of raw stock to the portion of the circulating liquor thus enriched, substantially as described.

2. The method of dyeing raw stock, which consists in feeding the stock in substantially small quantities into a receptacle or trough, subjecting the raw stock to the action of a standard dyeing solution in said receptacle, discharging the saturated raw stock and dyeing solution into a dyeing-vat in a substantially continuous manner, discharging the dyed raw stock from the dyeing-vat in a substantially continuous manner, returning the dyeing solution from the dye-vat to the receptacle, admixing a predetermined quantity of fresh dyeing solution with the solution taken from the dye-vat and applying this mixture to the raw stock, substantially as and for the purpose specified.

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

WILLIAM J. McCONVILLE.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.