J. J. FEARON.

DYEING PROCESS.

APPLICATION FILED MAY 2, 1913.

1,113,765. Patented Oct. 13, 1914.

Fig. 1.

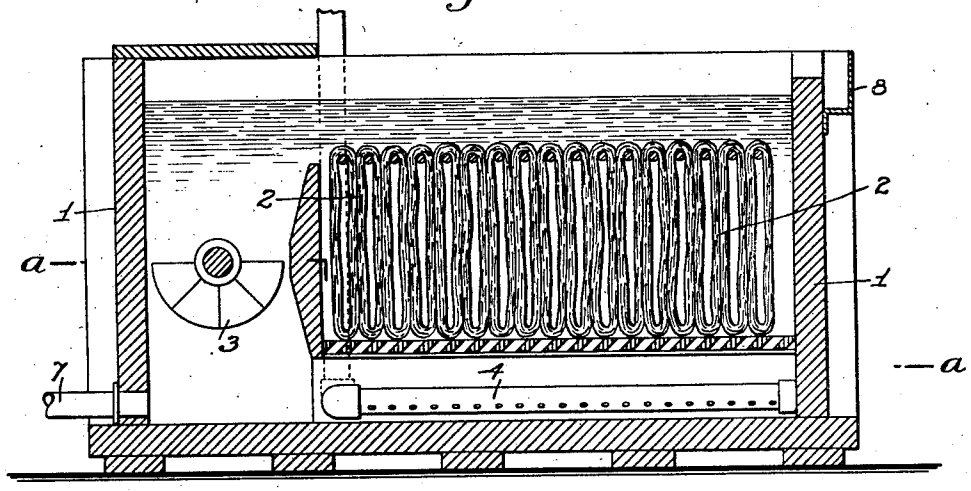
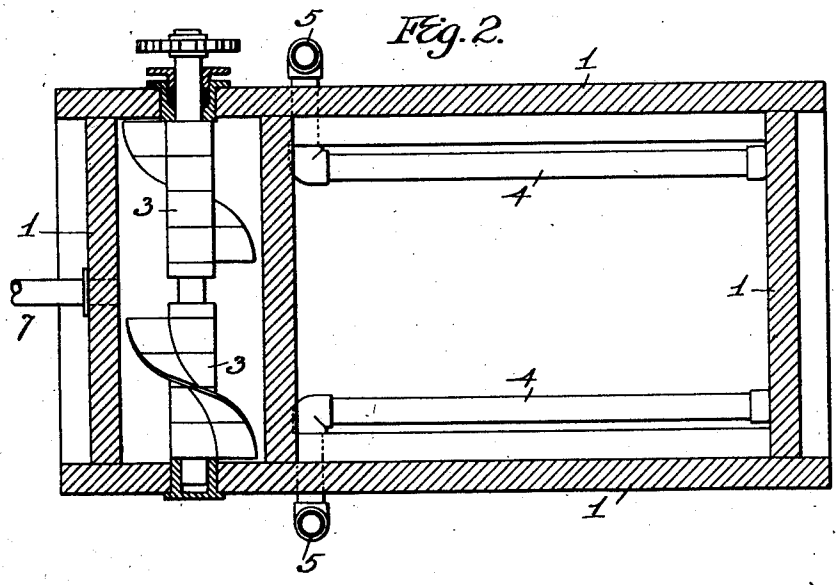


Fig. 2.



Witnesses

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DYEING PROCESS.

1,113,765. Specification of Letters Patent. Patented Oct. 13, 1914.

Application filed May 2, 1913. Serial No. 765,041.

To all whom it may concern:

Be it known that I, JAMES J. FEARON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Dyeing Processes, of which the following is a specification.

My invention relates to the dyeing of yarns in skein form with fast color anilin dyes such for instance as those which have recently come into extensive use under the name of "indanthrene" dyes. In preparing a dye bath with such dyes a sulfur compound generally known as "hydrosulfite" is used in the bath in which the color paste is dissolved, the purpose of this sulfur compound being to set the color upon the yarn. As a convenient characterization of the class of dyes to which my invention relates I have therefore adopted the term "sulfur dyes."

After the dyeing operation has been completed the hydrosulfite which may remain in the yarn must be neutralized or removed and this is generally effected by exposing the dyed yarn to the air. Unless, however, this removal is uniform throughout all portions of the yarn the production of a uniform color cannot be effected, some portions of the yarn being of a different shade from the others. This is especially noticeable in dying yarns in the skein and the objection I conceive to be due to the fact that as the yarns when in skein form are massed together the inner portions of the skein are not as readily accessible as the outer portions.

I find that the objection can be overcome by forcing air into the bath in which the dyed yarn is submerged, the air in passing through the bath serving to open up the masses of yarn, so that it can gain access to all portions of each skein, while at the same time all parts of the skein are uniformly saturated.

In the accompanying drawing I have shown one method of carrying out my invention in connection with a dye tub of the character constituting the subject matter of my application for U. S. patent, filed October 15, 1912, Serial No. 725,938, Figure 1 representing a longitudinal section of the tub, and Fig. 2 a horizontal section of the same on the line *a*—*a*, Fig. 1.

In the drawing, 1 represents the body of the tub, 2 the skeins of yarn, and 3 the liquid circulating device at one end of the tub.

In the lower portion of the tub, below the depending skeins 2, are a series of perforated longitudinal pipes 4 which may vary in number and location as may be found best adapted to secure the desired results. The pipes 4 communicate with pipes 5 at the sides of the tub, these pipes 5 being connected with any suitable device for forcing the air under pressure into the same. At one end of the tub, preferably that end at which the circulation device is located, is a pipe 7 for supplying clear water to the bath and at the opposite end of the tub is a suitable overflow, preferably in the form of a transverse trough 8, the top of this end of the tub being at a lower level than the opposite end and sides so as to provide for the overflow at this end only.

When the dyeing operation has been concluded, clear water is permitted to enter the tub through the pipe 7, the operation of the circulating device being still continued and air under pressure is admitted to the pipes 4 so as to be distributed through the bath and through the skeins of yarn contained therein. The addition of the clear water to the bath causes the level of the same to rise and the overflow now becomes effective, the clear water in time displacing the dye bath and having a washing action upon the skeins of yarn contained in the bath. This operation is continued until all traces of color are removed from the bath, or until scum (or "fluff" as the dyers term it) ceases to form on the top of the bath, whereupon the skeins can be withdrawn and dried in any suitable way.

By preference, the clear water first supplied to the bath is heated and such heating may be continued throughout the entire operation, or, during the later stages of the operation, cold water may take the place of the hot water.

As the oxygen in the air is presumably the active element in its effect upon the sul-

fur compound, oxygen gas may be substituted for air, if desired, but air is preferred for reasons of convenience and economy.

I claim:

1. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described, which consists in first subjecting the yarn to the action of a liquid dye bath, and then aerating a liquid bath in which the yarn is contained by passing air through said bath.

2. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described, which consists in first subjecting the yarn to the action of a liquid dye bath, then washing said yarn while still contained in a liquid bath, and aerating the bath during the washing operation by passing air through said bath.

3. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described, which consists in first subjecting the yarn to the action of a liquid dye bath, and then forcing air into and through the masses of yarn forming the skeins while the same are still contained in a liquid bath.

4. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described which consists in first subjecting the yarn to the action of a liquid dye bath, then washing said yarn while still contained in a liquid bath, and during the latter operation forcing air into and through the masses of yarn forming the skeins.

5. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described which consists in first subjecting the yarn to the action of a liquid dye bath, then washing said yarn by circulating wash water through a tub in which the yarn is contained, and, during the latter operation, aerating the bath by passing air through said wash water.

6. As an improvement in dyeing skein yarn with sulfur dyes, the mode herein described which consists in first subjecting the yarn to the action of a liquid dye bath, then washing said yarn by circulating wash water through a tub in which the yarn is contained, and, during the latter operation, forcing air into and through the masses of yarn forming the skeins.

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

JAMES J. FEARON.

Witnesses:
KATE A. BEADLE,
HAMILTON D. TURNER.