

(No Model.)

S. SANFORD.  
MACHINE FOR COLORING YARN.

No. 346,950.

Patented Aug. 10, 1886.

Fig. 1.

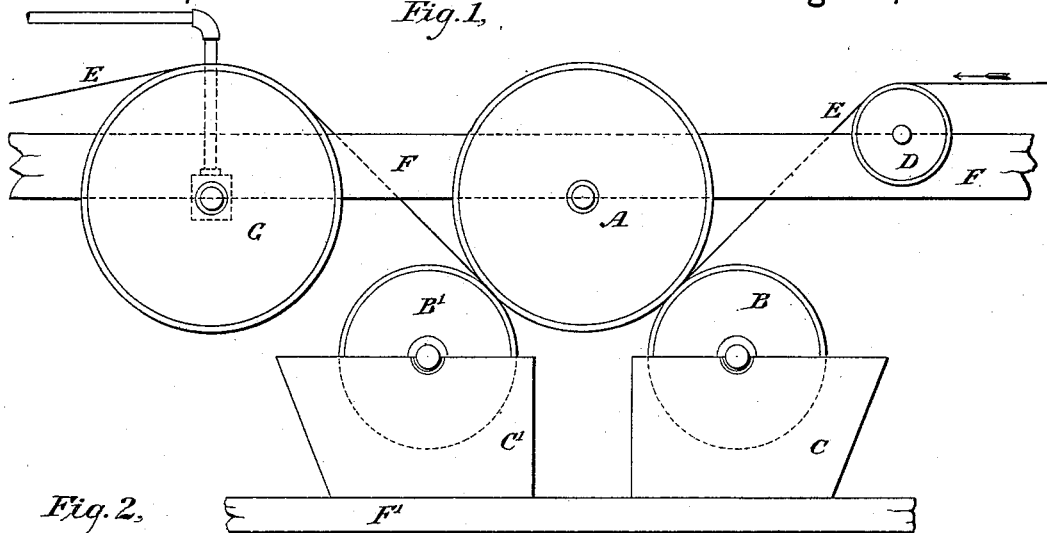
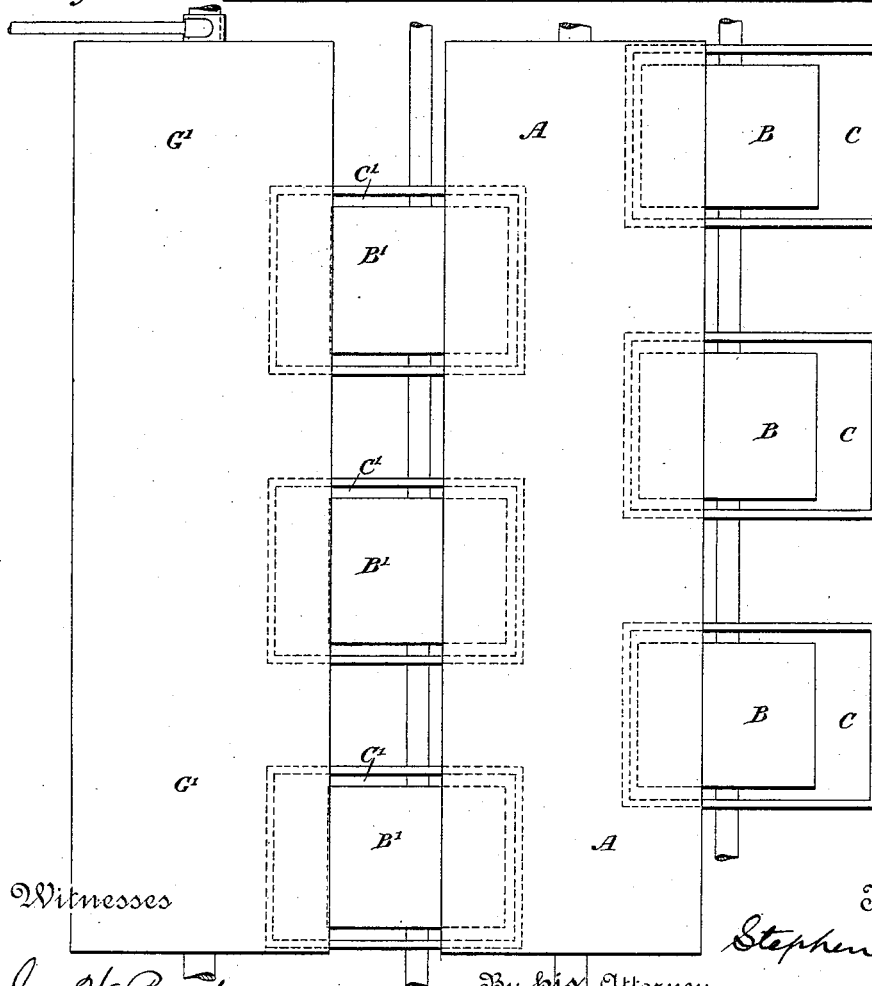


Fig. 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

STEPHEN SANFORD, OF AMSTERDAM, NEW YORK.

## MACHINE FOR COLORING YARN.

SPECIFICATION forming part of Letters Patent No. 346,950, dated August 10, 1886.

Application filed March 6, 1886. Serial No. 194,201. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN SANFORD, a citizen of the United States, residing in Amsterdam, in the county of Montgomery and State of New York, have invented a certain new and useful Improvement in Machines for Coloring Yarn; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of the specification, and to the letters and figures of reference marked thereon.

My invention relates to an improved apparatus for applying color to yarns; and it consists of a revolving drum or roller and of series of color-pulleys mounted in color-boxes, and so constructed and arranged that many different colors can be applied to different pieces of yarn in one and the same operation, or the same piece of yarn made of varied colors—that is, party-colored—in combination with an apparatus for fixing and setting the color in the yarn, as hereinafter described and claimed.

In a prior patent granted to me October 6, 1885, and numbered 327,599, an improvement in apparatus for dyeing and sizing is shown, in which color pulleys and boxes are combined with sizing apparatus.

My present invention is designed to show a method and apparatus for coloring yarn satisfactorily without the use of any sizing apparatus.

My invention is shown in the accompanying drawings, in which Figure 1 is a vertical section, and Fig. 2 a horizontal section, of my apparatus.

Similar letters indicate similar parts in both figures.

A is a large iron roller or drum, said roller turning on a shaft, bearings of which shaft are in the frame-work F of the coloring-machine.

E represents the yarn passing through the coloring-machine.

The pulleys and the boxes containing the color are part of them arranged in a series on one side of the roller A, and part of them arranged in a series on the other side of the roller A. There are as many of these color-pulleys as there are stripes of color desired to be stamped upon the yarn, and there is a color-box for each color-pulley.

B B are the color-pulleys on one side of the roller A, and B' B' are the color-pulleys on the other side of the roller A. I prefer to make the one series of the color-pulleys B B by cutting away a common shaft of suitable length in such a way that the projecting parts that remain shall form the series of pulleys B B, and the series B' B' by cutting away another shaft in the same way. The portions of the two shafts not cut out act as the respective color-pulleys, and act to stamp the colors upon the yarn. However, each color-pulley may be mounted in separate bearings in the edges of its own color-box, so as to be free to revolve in its own bearings, and independently of the rest of the series. The color-pulleys B B and B' B' are arranged as shown in Fig. 2, the pulleys B' B' being opposite the intervals between the pulleys B B, and the pulleys B B being opposite the intervals between the pulleys B' B'.

C C are boxes containing coloring material, in which the pulleys B B revolve.

C' C' are boxes containing coloring material, in which the color-pulleys B' B' revolve.

There is a separate color-box for each color-pulley, and any colors, as described, may be put in these color-boxes C C and C' C'.

The color-pulleys B B and B' B' are suitably mounted in the frame of the machine, or each in its own color-box, and are free to revolve.

D is a roller, over which the yarn E passes, as shown in Fig. 1, as it is being drawn into the machine in the usual way. The direction of the movement of the yarn is indicated by an arrow in Fig. 1.

G is a cylinder revolving upon a shaft suitably mounted in the frame F. After being drawn through the coloring apparatus, the yarn E passes over the cylinder G. The cylinder G is heated in any usual manner, as by introducing steam into it by means of the steam-pipe and hollow axle shown in the drawings. The heat thus produced on the surface of the cylinder G acts upon the colored yarn by causing the color to penetrate more thoroughly the fibers and cells of the yarn, thus fixing or setting the color in the yarn, and also by strengthening and bringing out the color.

The roller D and the cylinder G hold the yarn lightly against the face of the roller A, so as to be easily operated upon by the color-pulleys B B and B' B', revolving against the

yarn E, as the yarn passes through the coloring-machine.

The color-pulleys B B and B' B', as they revolve in the boxes containing the dyes, bring up each the dye out of its box and fix each its dye on the yarn in a continuous stripe; or, if any circumferential part of the face of the pulley has been cut away, then only so much of the yarn as comes in contact with the parts of the face of the pulley not cut away is stamped with the color.

In the place of the cylinder G, any other suitable means of heating the yarn after it has been colored may be used, as by passing the yarn over steam-pipes, or subjecting it to heat in any equivalent manner, so as to produce the results above indicated. In such case, if necessary, a simple roller, exactly like the roller D, already described, is substituted in the place of the cylinder G. The two rollers then serve to hold the yarn lightly against the face of the roller A, just as the roller D and the cylinder G do in the former case.

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

1. In combination with alternating series of color-pulleys B B and B' B', alternating series of color-boxes C C and C' C', and a heated cyl-

inder or other suitable means for heating the yarn, substantially as and for the purposes set forth.

2. In combination with the roller A, alternating series of color-pulleys B B and B' B', alternating series of color-boxes C C and C' C', and a heated cylinder or other suitable means of heating the yarn, substantially as and for the purposes set forth.

3. In combination with the heated cylinder or roller G, alternating series of color-pulleys B B and B' B' and alternating series of color-boxes C C and C' C', substantially as and for the purposes set forth.

4. In combination with the heated roller G, or other suitable means for heating the yarn, alternating series of color-pulleys B B and B' B', alternating series of color-boxes C C and C' C', and yarn-conducting rollers A D, substantially as and for the purposes set forth.

5. In combination with the color-pulleys and color-boxes of a coloring-machine, the heated cylinder or roller G, substantially as and for the purposes set forth.

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Witnesses:

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