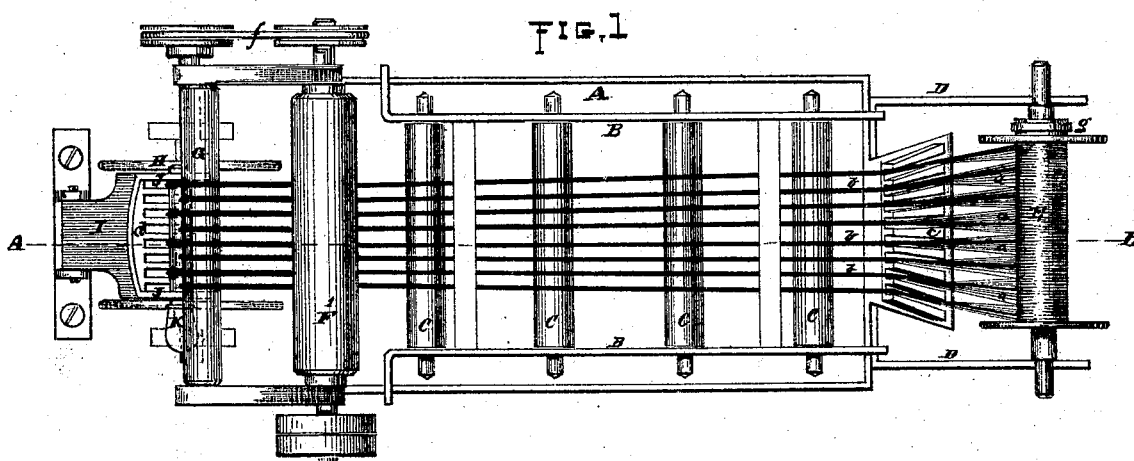
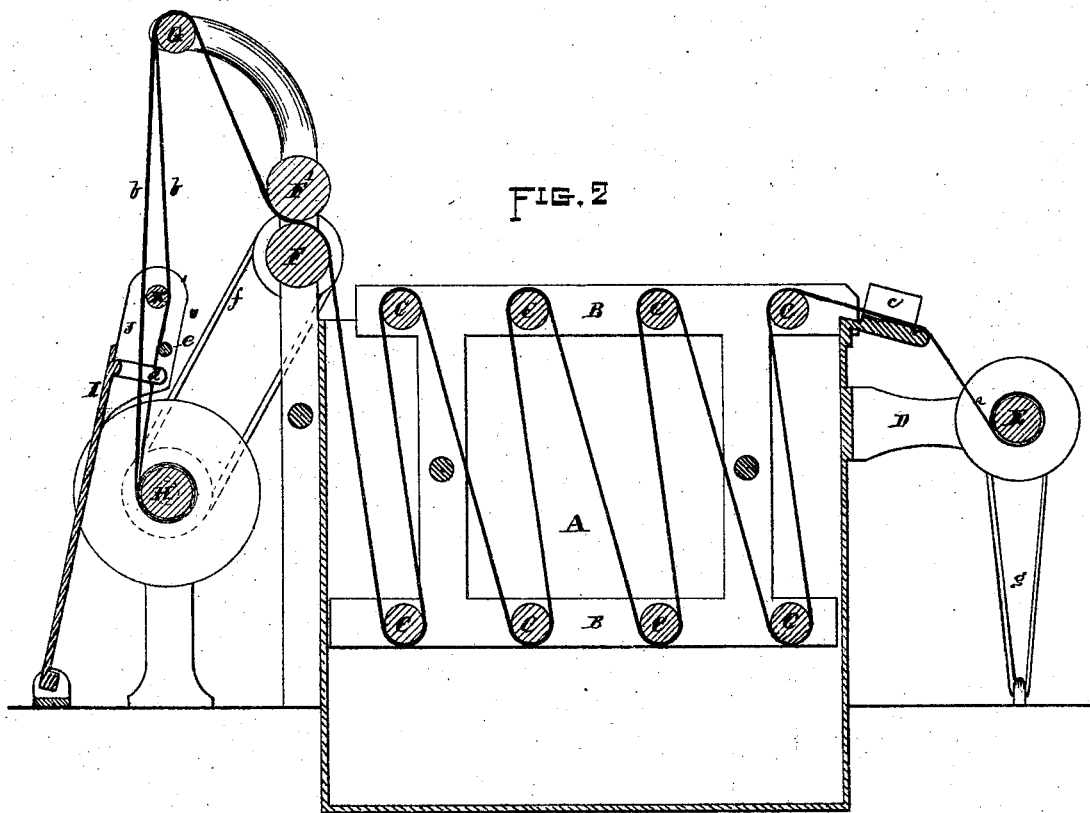


N. D. WHITE.

Improvement in Apparatus for Coloring Warps.

No. 116,125.

Patented June 20, 1871.



Witnesses

*Charles Burleigh*  
*A. E. Prince.*

Inventor

*Nelson S. White*

# UNITED STATES PATENT OFFICE.

NELSON D. WHITE, OF WINCHENDON, MASSACHUSETTS.

## IMPROVEMENT IN APPARATUS FOR COLORING WARPS.

Specification forming part of Letters Patent No. 116,125, dated June 20, 1871.

*To all whom it may concern:*

Be it known that I, NELSON D. WHITE, of Winchendon, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Apparatus for Coloring Warps; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing which forms a part of this specification, in which—

Figure 1 represents a top or plan view of my improved apparatus, and Fig. 2 represents a vertical central section at line A B, Fig. 1.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

The object of my invention is to obtain an even and uniform color, while, at the same time, obviating the breaking, twisting, and knotting of the threads, which occurs during the operation of coloring, drying, &c., by the mode practiced prior to my invention; the nature of which consists in the combination of certain peculiarly-constructed devices, as hereafter described.

In the drawing, A represents the die or coloring-tank or vat, in which the coloring-liquid is placed. In this tank is arranged a frame, B, in which is arranged a series of rolls, C, while from the rear project two supporting-arms, D D, for supporting the yarn-beam E. Beam E is filled with yarn, the threads *a* being sufficient in number to form a full warp. After the end of the warp containing the "lease" has been passed over and under the roller C, between the rolls F F', over the roll G, and then down and around the beam H, the body of the warp is separated into suitable divisions *b*, and passed between the guides *c* and *d*, as indicated in the drawing. The guides *d* are supported in this instance by the frame I, which is pivoted or hinged at its lower end, as indicated in the drawing, whereby, as the beam H is filled, frame I can swing back; and to prevent the divisions *b* from slipping out from between the guides *d*, which are made in the form of a comb, a stop-pin, *e*, is passed through the sides J J of the frame I. To prevent one division, *b*, of the warp-threads from catching and breaking those of another while

passing through the guides *d*, a dividing or separating rod, K, is slipped through them, as shown, whereby the different divisions *b* of the warp-threads are separated to such an extent, from the time that they pass the roll G until they are wound upon the beam H, that there is no danger or liability of the threads of one division which may happen to be a little slack catching and running in with those of another division. After the warp has been passed through the coloring-liquid and wound upon the beam H the latter may be substituted for the beam E and the warp run through a second time, the operation being repeated as many times as desired.

It will be understood that a positive motion is imparted to the roll F, and that the beam H is driven by a friction-band, *f*, of only sufficient force to keep the warp tight and wind it up as fast as delivered by the rolls F F'. The beam E is held, by a friction-band or strap, *g*, from turning too fast, the object being to keep the threads from knotting or kinking during their passage from beam E to the rolls F F'. The guides *c* may be made in the form of pins, if preferred. The frame which supports guides *d* may be made to slide back and forth, if preferred.

From the foregoing description it will be seen that, as the full warp is passed through from a single beam, the same being divided into proper divisions to give the requisite support to the threads, a very uniform and even color must be the result, while the threads being kept separated in divisions, and all wound upon a receiving-beam as fast as they are run off the delivering-beam, nearly all damage resulting from breaking, knotting, and twisting of the threads by the old method is obviated.

By the use of my invention the yarn can be run from one beam to another through all the subsequent operations preparatory to weaving. By the old method only one section of warp-threads was run through the coloring substance at a time, the threads being passed through a trumpet or mouth-piece as they were run from the delivering-beam to the dyeing-tank, while, when they passed down from the roll G, they were allowed to fall into a bunch or pile upon the floor. Then, in the subsequent operations of re-dyeing, drying, and sizing, the warp had

to be handled and worked from the bunch or pile, thus subjecting it to great damage and injury from breakages, twisting, knotting, and dirt. Then, again, by the old mode of running the warp through the dye in one large mass the threads could not be dyed or colored uniformly; some would not be colored sufficiently, and hence the cloth would be imperfect in appearance and less desirable. All these objections are obviated by my invention, while much labor is saved in handling.

Having described my improved apparatus for coloring warps, what I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the coloring-tank

A, provided with a series of yarn-rolls, C, and draft-rolls F F', of the yarn-guides *c d*, supporting-rolls G, separating-rod or pin K, and holding-pin *e*, substantially as and for the purposes set forth.

2. The swinging frame I, provided with comb-guides *d*, and separating-rod K, substantially as and for the purposes set forth.

3. The combination, with the delivering-beam E, receiving-beam H, and supporting-rod G, of guides *c d* and separating-rod K, substantially as and for the purposes set forth.

NELSON D. WHITE.

Witnesses:

CHAS. H. BURLEIGH,

A. E. PEIRCE.