A. SMITH.

Press Dyeing.

No. 7,446. Patented June 18, 1850.

Fig. 1.

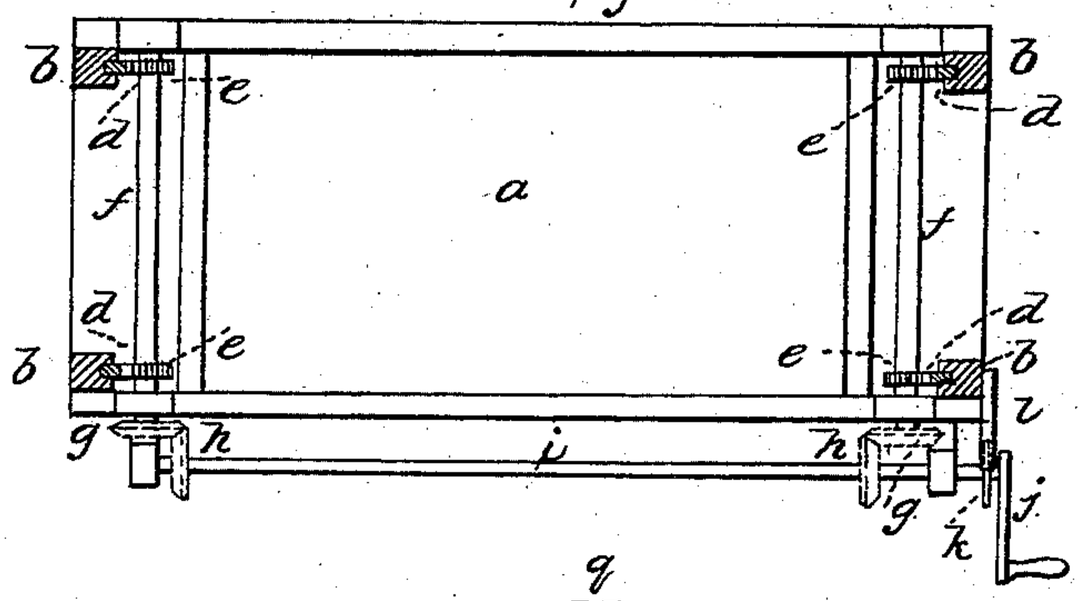



Fig. 2.

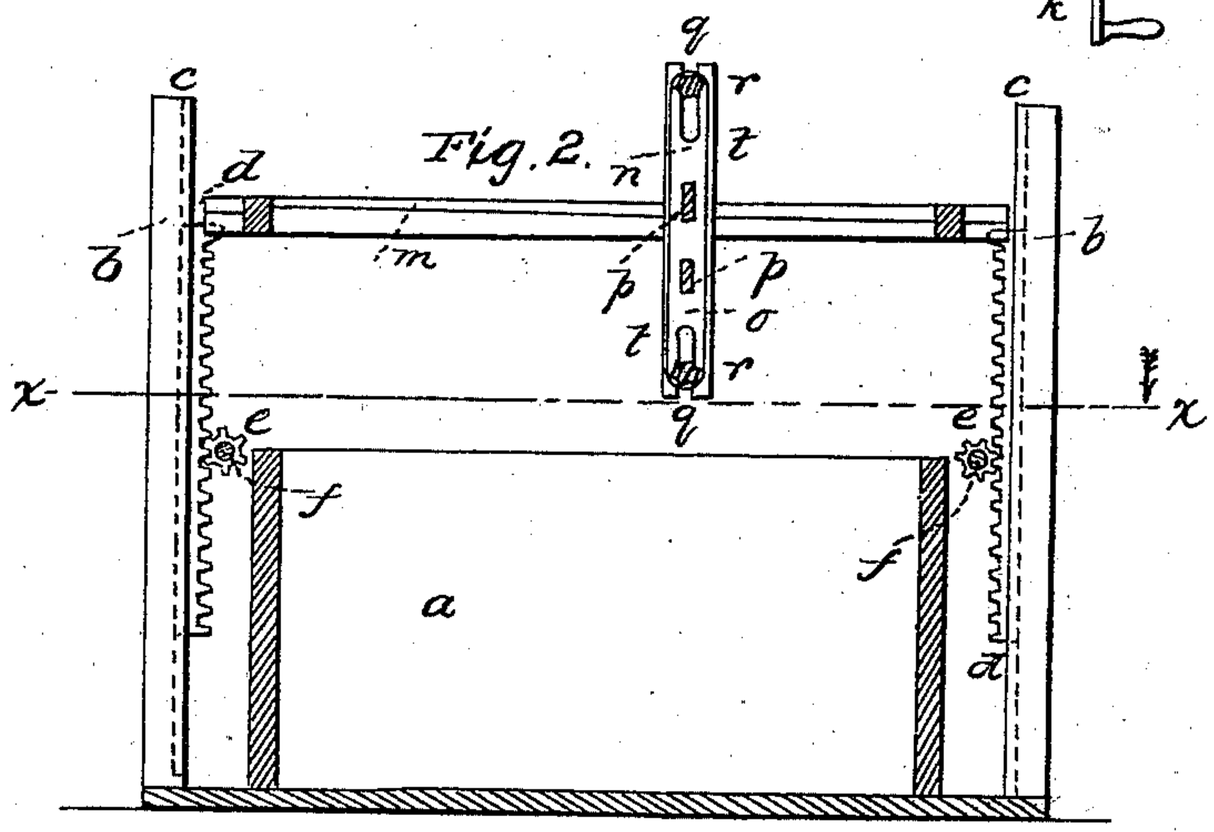



Fig. 3.

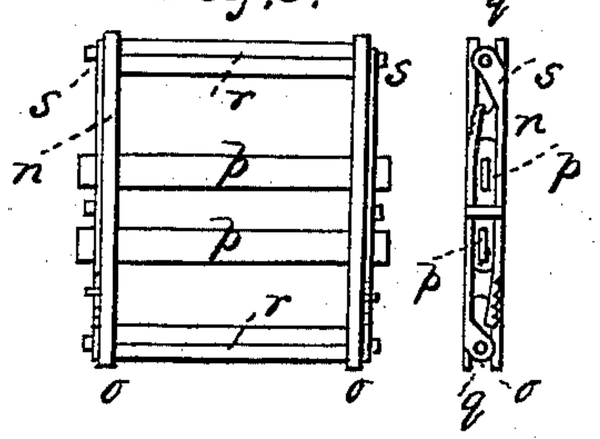
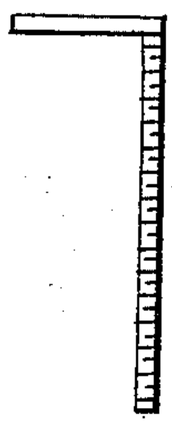



Fig 4.



# UNITED STATES PATENT OFFICE.

ALEXANDER SMITH, OF WEST FARMS, NEW YORK.

## APPARATUS FOR PARTY-COLORING YARN.

Specification forming part of Letters Patent No. 7,446, dated June 18, 1850; Reissued May 11, 1852, No. 217.

*To all whom it may concern:*

Be it known that I, ALEXANDER SMITH, of West Farms, in the county of Westchester and State of New York, have invented certain new and useful Improvements in the Machine for Party-Coloring Yarns, and that the following is a full, clear, and exact description of the principle or character which distinguishes my invention from all other things before known and of the method of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a horizontal section at *x x* of Fig. 2, which is a longitudinal vertical section, and Fig. 3 face and side elevations of the reel frame and reels, and Fig. 4, the scale.

The same letters indicate like parts in all the figures.

Yarns have heretofore been party-colored either by printing or by dipping skeins into a vat of dyeing liquor with the parts which were not to be dyed tied up or wrapped around to prevent the access of the dyeing liquor. But as heretofore practiced these methods have been attended with serious practical difficulties, the former not admitting of giving permanent colors besides requiring complex machinery the working of which demands much skill and attention—and the later having been unsuccessful for the reason that the means employed for preventing the access of the dyeing liquor to the parts not to be dyed would not effectually exclude the coloring matter. In the method which I have invented for this purpose the yarns to be partly colored are rolled around two rollers or reels, either fluted or made of wire and placed one at each end of a frame, the journals of either one or both of the said reels working in slides connected with the frame. One or any number of these reel frames are then suspended to a vertically sliding frame operated by appropriate machinery, by means of which the reels with the yarns on them can be let down into a vat containing the dyeing or coloring liquor, the depth of immersion being indicated by a scale either marked on or suspended to the frame of the reels. After the required immersion the reel frames are removed and either reversed to immerse the other end or the reels turned to bring another part of the yarns in the proper position—depending on the pattern to be produced—and then again dipped in the same or another color. After the yarn has been immersed the immersed reel is drawn up by the slide that the rods or flutes of the reel may not be in contact with the yarn, which contact would have the effect of preventing the free access of the dyeing liquor to the entire surface of the yarn and thus leave an imperfect color.

In the accompanying drawings (*a*) represents a vat to contain the dyeing liquor and (*b*, *b*, *b*, *b*,) four vertical posts one at each corner grooved out vertically as at (*c*) to receive four slides (*d*, *d*, *d*, *d*) with rack teeth in them. To these racks are fitted four pinions (*e*, *e*, *e*, *e*,) two on each of two horizontal shafts (*f*, *f*,) one at each end of the vat—and these two shafts are connected together to move in unison by two beveled cog wheels (*g*, *g*,) on their ends which engage two similar wheels (*h*, *h*,) on a horizontal shaft (*i*) which shaft is provided at one end with a crank handle (*j*) by which the sliding racks can be elevated or depressed and with a ratchet wheel (*k*,) and catch (*l*,) for holding them in any position desired.

The four sliding racks carry a horizontal frame (*m*,) in which may be suspended any desired number of reel frames similar to the one (*r*) shown in the drawings. This reel frame is composed of two side pieces ( *o*, *o*,) connected by cross-bars (*p*, *p*,) which project sufficiently beyond the side pieces to rest on the frame (*m*). The ends of the side pieces are slotted as at (*q*) to receive and admit of the sliding in and out of the journals of two reels (*r*, *r*,) which reels are either fluted rollers or made with wire rods attached to two heads on a shaft. The journals of these reels are fitted to turn in plates or slides (*s*, *s*,) at the sides of the reel frame and are provided with catch teeth so that they can be held in any desired position by catching onto pins in the sides of the reel frame.

The yarns to be party-colored are wound by any means desired around the two reels as represented at (*t*,) and then the reel frame is suspended in the horizontal frame. As many of such reel frames as the frame (*m*) will carry can be in like manner suspended. A scale (*u*) is then suspended to one of the reel frames and by turning the

crank handle the whole is let down into the dyeing liquor to the depth desired as indicated by the scale depending on the figure to be produced in the weaving of the fabric. The lower reel is then drawn up by means of the sliding plates (*s*, *s*,) so as to give the liquor free access to the whole surface of the immersed yarn. After the proper period of immersion the whole is drawn out of the liquor, the lower reel drawn out again to tighten the yarns and then the reel frames removed to rinse out the surplus coloring matter. If the figure to be produced admits of it, as well as the distance of the two reels apart, the reel frames may be inverted to dip the other end in like manner in the same or any other color; but otherwise the reels are to be turned to bring other parts of the yarn in a proper position to be immersed in the same or another color. In this way yarns can be party-colored in any manner desired either for the warp or weft for the weaving of figured fabrics.

It will be obvious from the foregoing that although I have described only that particular mode of construction which I have myself adopted, this may be varied greatly within the range of the principle of my invention; and therefore I do not wish to confine myself to the special mode of construction or arrangement herein specified but to retain to myself the privilege of varying them at pleasure, so long as I attain the same end by equivalent means.

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

1. The method substantially as herein described of party-coloring yarns by winding them on reels arranged in frames so constructed as to admit of immersing in dyeing liquor such portions of the yarns as are desired to be dyed and shifting the same for dyeing other parts in like manner, substantially as described.

2. And I also claim connecting one or both of the reels in each frame by means of slides to admit of removing the reel from contact with the yarns while in the process of dyeing, substantially as specified.

ALEXANDER SMITH.

Witnesses:
SAMUEL M. PURDY,
JOHN G. MCNAIR.

[FIRST PRINTED 1913.]