

(No Model.)

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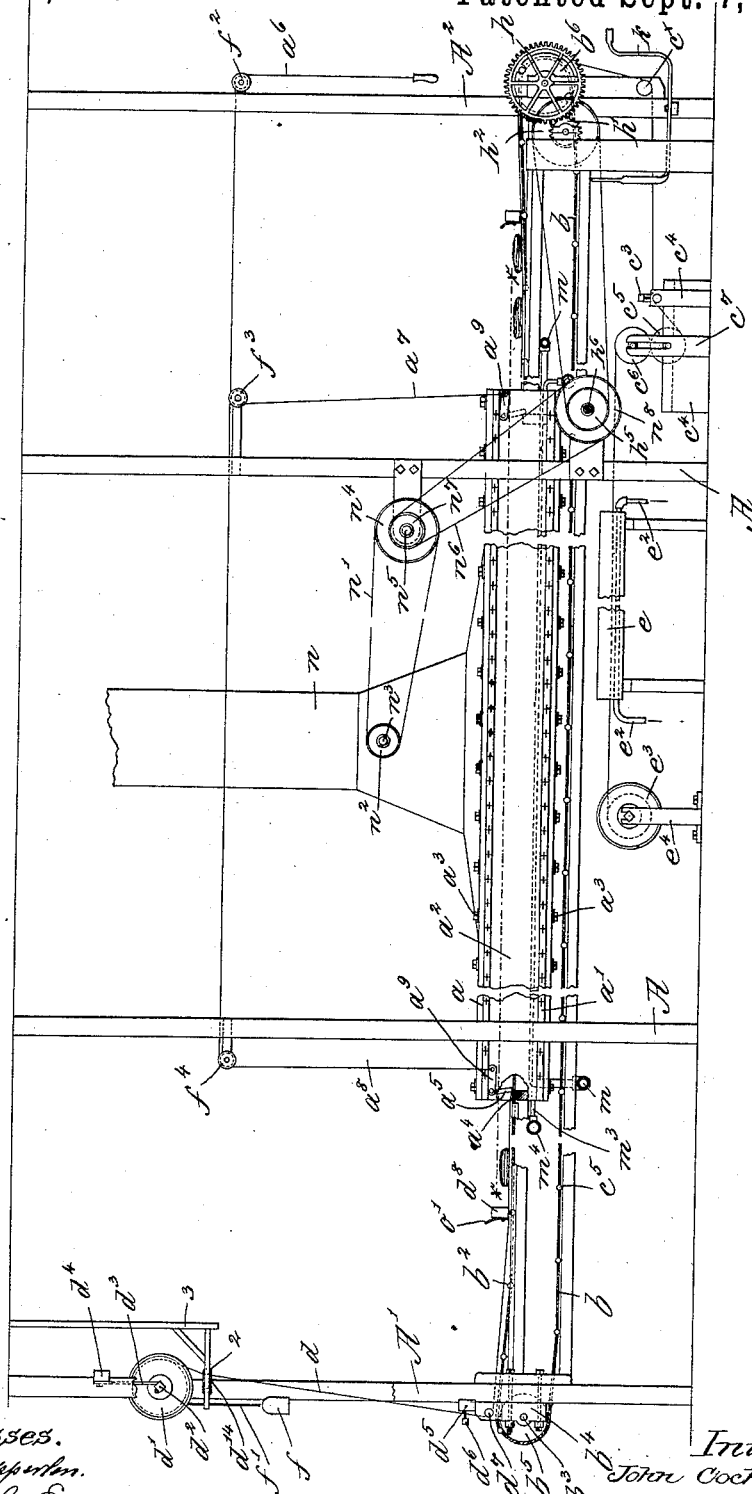
J. COCHRANE, Jr.

APPARATUS FOR STEAMING FABRICS OR YARNS.

No. 348,616.

Patented Sept. 7, 1886.

Fig. 1.



Witnesses.  
Arthur Zimmerman.  
Fred L. Emery.

Inventor:  
John Cochrane, Jr.  
by Leraby Gregory  
Atty.

(No Model.)

2 Sheets—Sheet 2.

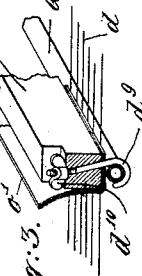
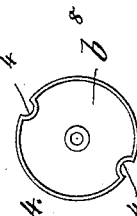
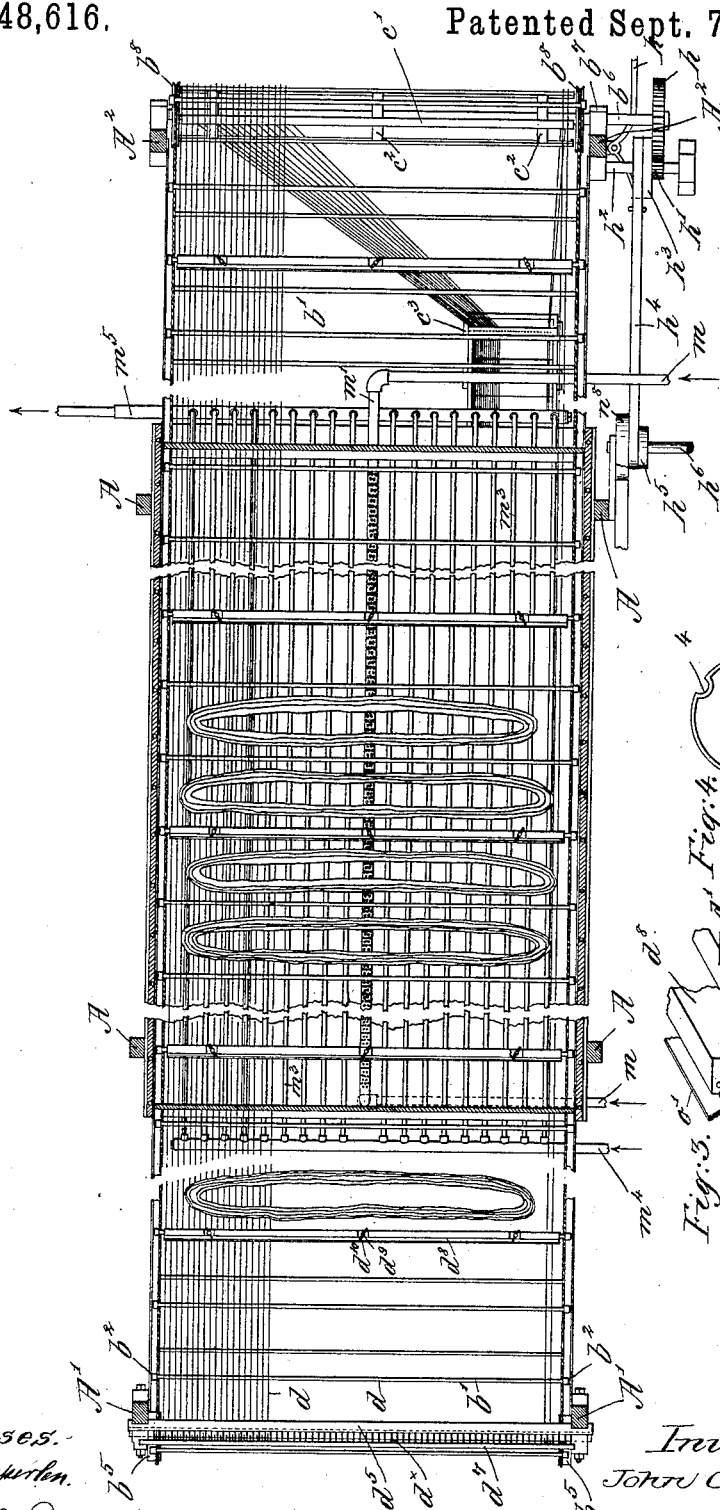
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Fig. 2.



Witnesses.  
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Fred L. Emery.

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# UNITED STATES PATENT OFFICE.

JOHN COCHRANE, JR., OF MALDEN, MASSACHUSETTS.

## APPARATUS FOR STEAMING FABRICS OR YARNS.

SPECIFICATION forming part of Letters Patent No. 348,616, dated September 7, 1886.

Application filed June 11, 1886. Serial No. 204,847. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN COCHRANE, JR., of Malden, county of Middlesex, and State of Massachusetts, have invented an Improvement in Apparatus for Setting Colors, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide apparatus in which printed yarn to be used in the manufacture of that class of carpets known as "tapestry carpets" may be exposed to the action of steam and heat while wet, whereby the color in the said yarn may be more thoroughly set or fixed, the said color being more clearly developed and sharply defined than has been possible hitherto.

In accordance with my invention the printed yarn, taken wet from printing cylinders or drums of any ordinary construction, is placed upon a bed secured to or forming part of an endless carrier, which is moved by suitable gearing through a chamber or trough into which steam is admitted, the humidity of the steam in the said chamber determining the sharpness or distinctness of the color when developed, and being controlled and regulated by means of pipes radiating heat into said chamber or trough.

My invention consists, essentially, in a steaming-chamber, an endless carrier, and a bed resting thereon and movable therewith, combined with means, as will be described, to move the said carrier, and with it the bed, through the said steaming-chamber.

Other features of my invention will be hereinafter pointed out in the claims at the end of the specification.

Figure 1 is a side elevation of an apparatus constructed in accordance with my invention; Fig. 2, a partial plan and section of Fig. 1, the section being on line *x x*; and Figs. 3 and 4 details to be referred to.

The chamber or trough in which the printed skeins of wet yarn are steamed is herein shown as composed of top *a*, bottom *a'*, and side pieces, *a''*, secured together by suitable bolts, *a'''*, the chamber having ends, each of which is herein shown as made in two parts, one part, as *a<sup>1</sup>*, being stationary, while the other part, as *a<sup>2</sup>*, is movable, it being shown

as pivoted with relation to the said sides *a''* and constituting a door for the end of the chamber or trough.

The chamber referred to is herein shown as sustained upon cross-beams secured to uprights *A*, constituting part of the frame-work of the apparatus. The chamber or trough has passed through it a carrier for the printed wet yarn, the said carrier consisting, as herein shown, of endless ropes or chains *b*, constituting sides, one on each side of the apparatus, the said ropes or chains being joined by rods *b'*, provided with openings at each end, through which the said ropes or chains are passed, the said rods being firmly fastened to the said ropes or chains by caps *b<sup>2</sup>*, screwed into the end thereof.

At the forward end of the apparatus is a shaft, *b<sup>3</sup>*, mounted in bearings *b<sup>4</sup>*, attached to uprights *A'*, the said shaft having mounted upon it at each end a pulley, *b<sup>5</sup>*, and at the rear end of the apparatus is a shaft, *b<sup>6</sup>*, supported in bearings *b<sup>7</sup>*, secured to uprights *A''*, the shaft *b<sup>6</sup>* having mounted upon it at each end a pulley, *b<sup>8</sup>*, the pulleys *b<sup>5</sup>* *b<sup>8</sup>* on each side of the apparatus having passed about them one of the endless ropes or chains *b*. The carrier, composed of the endless ropes or chains *b* and rods *b'*, forms a support for a bed upon which the printed skeins are laid.

The bed referred to is herein shown as composed of a number of threads, *d*, of cotton, jute, or other suitable material, and preferably the said threads will be of that material which will constitute the warp for the back of the carpet.

The threads *d* used for the bed referred to are herein shown as taken from a spool or bobbin, *d'*, mounted on a squared shaft, *d''*, supported in open or loose bearings *d'''*, attached to a cross-beam, *d<sup>4</sup>*, secured to the uprights *A'*. These threads are passed through an eye, *2*, supported in usual manner by a frame, *3*, thence through a comb, *d<sup>5</sup>*, herein shown as secured to the uprights *A'* by set-screws *d<sup>6</sup>*, the said threads thence passing under a roller, *d<sup>7</sup>*, and along the top of the carrier to which they are secured, as herein shown, by clamping-bars *d<sup>8</sup>*, the said clamping-bars being secured at intervals throughout the length of the carrier to the rods *b'* by hooked rods *d<sup>9</sup>*, which encircle the rods *b'* and are extended through

the clamping-bar  $d^8$ , the said bars  $d^8$  being secured to the said rods by thumb-screws  $d^{10}$ , as shown in Fig. 3.

The tension upon the threads  $d$  is regulated in usual manner by means of a weight,  $f$ , secured to one end of a belt,  $f'$ , which is passed over a pulley on the shaft  $d^2$  and not shown, the other end of said belt being fastened to the comb  $d^9$ .

The threads  $d$  at the rear of the apparatus are passed over a drum composed of bars  $c'$ , secured to disks  $c''$  on the shaft  $b^6$ , thence under a roller,  $c^x$ , and are then gathered by a reed, as  $c^3$ , of the usual construction, it being located above the upright  $c^4$ .

In Fig. 2 most of the threads  $d'$  are omitted to avoid hiding the mechanism.

From the reed  $c^3$  the threads  $d$  are passed through a bath of preferably soap and water contained in a vat,  $c^1$ , the said threads passing under a roller,  $c^5$ , then between the said roller and a superimposed roller,  $c^6$ , the said rollers having their bearings in uprights  $c^7$ , the bath of soap and water subduing the color in the thread  $d$ , and removing the acid imparted to them by the printed wet yarns resting upon them, while the said printed wet yarns are being steamed. From the roller  $c^6$  the threads  $d$  are passed through a drier,  $e$ , heated, as shown, by steam circulating through a pipe,  $e^2$ , the said threads  $d$ , as they issue from the said drier, being wound upon a spool or bobbin,  $e^3$ , supported by and rotating in uprights  $e^4$ . The shaft  $b^6$  has a gear,  $h$ , in mesh with a pinion,  $h'$ , on a shaft,  $h^2$ , said shaft  $h^2$  having mounted on it a pulley,  $h^3$ , connected by a belt,  $h^4$ , with a pulley,  $h^5$ , on the main shaft  $h^6$ , driven in any usual manner, the rotation of the shaft  $b^6$  causing the carrier and its attached bed to travel through the steaming-chamber.

In operation the printed skeins of wet yarn are taken from the printing-cylinders or drums (not shown) and are laid upon the bed formed, as herein shown, by the threads  $d$ , there being a single skein between two adjacent bars,  $d^8$ . When the desired number of skeins has been placed upon the bed at the forward or receiving end of the apparatus, which number is limited by the capacity of the steaming-chamber, the belt-shipper  $k$  is moved to transfer the belt  $h^4$  upon the pulley  $h^5$ , and then after by the gearing described the same is set in position. During the movement of the carrier through the steaming-chamber the doors  $a^5$  are opened, as herein shown, by pulling the cord  $a^6$ , passed over the pulley  $f$ , the said cord having branches  $a^7$   $a^8$ , passed over pulleys  $f^3$   $f^4$ , respectively, the said branches being each connected to the crank  $a^9$ , secured to each door  $a^5$ .

In operation I prefer to give the carrier an intermitting movement and to make three stops of about twenty minutes each, so that each skein of wet yarn is exposed to the action of steam and heat in the steaming-chamber for about one hour. During the movement of the carrier to place the wet yarn in the

steaming-chamber, the doors  $a^5$  are open, but when sufficient quantity of wet yarn has been placed in the said chamber, the said doors will be closed by gravity. Steam is supplied to the steaming-chamber by pipes  $m$ , joined, as herein shown, to the ends of a central perforated pipe,  $m'$ , the said steam issuing through the perforations of said central pipe. The humidity of the steam is controlled, as herein shown, by means of a series of pipes,  $m^3$ , extended the length of the steaming-chamber, and having their ends joined to a steam-inlet,  $m^4$ , and outlet-pipe  $m^5$ . (See Fig. 2.) After the printed wet yarn has been steamed the required time, the carrier is set in motion, and as that part of the carrier which supports the steamed wet yarn approaches the rear of the apparatus, the bars  $d^8$  are unclamped and removed, and the said printed wet yarn is then taken off and washed and dried in any usual manner. As the carrier passes about the drum at the rear of the apparatus, each rod  $b'$  in turn is received in a recess,  $4$ , diametrically opposite on the periphery of the pulley  $b^6$ , (see Fig. 4,) the said rods being set a distance apart equal to the development of the semi-circumference of said pulley. Steam is exhausted from the steaming-chamber through the stack or chimney  $n$ , provided with a fan, (not shown,) but which is driven by a belt,  $n'$ , passed over a pulley,  $n^2$ , on the fan-shaft  $n^3$ , and over a pulley,  $n^4$ , on a shaft,  $n^5$ , rotation being imparted to the shaft  $n^5$  by a belt,  $n^6$ , said latter belt, passing over a pulley,  $n^7$ , on the shaft  $n^3$ , and also over a pulley,  $n^8$ , on the main shaft  $h^6$ . As an additional safe-guard against the injury of the threads  $d$ , I prefer to dress the said threads with a mixture of starch and soap.

I have herein described the bed upon which the printed wet yarn is laid as composed of threads  $d$ ; but it is evident that the said bed may be an endless belt of wire or other suitable material resting upon or secured to the carrier, and so as to move or be moved in unison with it.

To prevent any considerable quantity of steam from escaping from the steaming-chamber when the doors  $a^5$  are opened, I have provided each clamping-bar  $d^8$  with a preferably rubber flap,  $o'$ , (see Fig. 3,) which scrapes against the roof of the steaming-chamber.

The clamping-bars  $d^8$  are described as fastening the threads  $d$  to the bars  $b'$ ; but when the bed is an endless belt the said bars may still be employed as a support for the flaps  $o'$ .

If desired, the carrier may be moved very slowly, and thus render the process a continuous one; but I prefer the intermitting movement described.

I claim—

1. In an apparatus for setting colors, the steaming-chamber, a movable endless carrier, and a bed resting thereon and movable therewith, and upon which the printed wet yarn rests, substantially as described.

2. In an apparatus for setting colors, the

steaming-chamber, a movable endless carrier, and a bed resting thereon and movable therewith, combined with means, substantially as described, to move the said carrier and its bed through the said steaming-chamber, for the purpose specified.

3. In an apparatus for setting colors, the steaming-chamber, an endless carrier composed of sides *b* and bars *b'*, uniting said sides, and a bed resting thereon, combined with means to move the said carrier and its bed through said steaming-chamber, substantially as described.

4. In an apparatus for setting colors, the steaming-chamber, an endless carrier composed of sides *b* and bar *b'*, uniting said sides, a bed composed of threads *d* resting upon the bars *b'*, and clamping-bars *d''*, to secure said bed to the carrier, combined with means, substantially as described, to move said endless carrier and its attached bed, for the purpose set forth.

5. In an apparatus for setting colors, a steaming-chamber provided at its ends with doors, means to open said doors, an endless carrier, and a bed resting thereon, combined with means to move said endless carrier and its bed, substantially as set forth.

6. In an apparatus for setting colors, a

steaming-chamber, an endless carrier, a bed composed of threads *d*, and devices to clamp said threads to the endless carrier, combined with means to move said endless carrier and its attached bed, substantially as set forth.

7. In an apparatus for setting colors, a steaming-chamber, an endless carrier, a bed composed of threads *d*, and devices to clamp said threads to the endless carrier, combined with means for moving said endless carrier and its attached bed, and with means, substantially as described, to cleanse and dry said threads, as and for the purpose set forth.

8. In an apparatus for setting colors, the steaming-chamber, an endless carrier composed of sides *b* and bars *b'*, uniting said sides, a bed resting thereon, and means, as described, to move the said carrier and bed through the steaming-chamber, combined with the bar *d''* and flap *o'*, to check the escape of steam from the said steaming-chamber, substantially as described.

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

JOHN COCHRANE, JR.

Witnesses:

G. W. GREGORY,

JAS. H. CHURCHILL.