Oct. 6, 1925. 1,555,864

T. McCONNELL

MACHINE FOR MERCERIZING YARN

Filed April 21, 1923 2 Sheets-Sheet 1

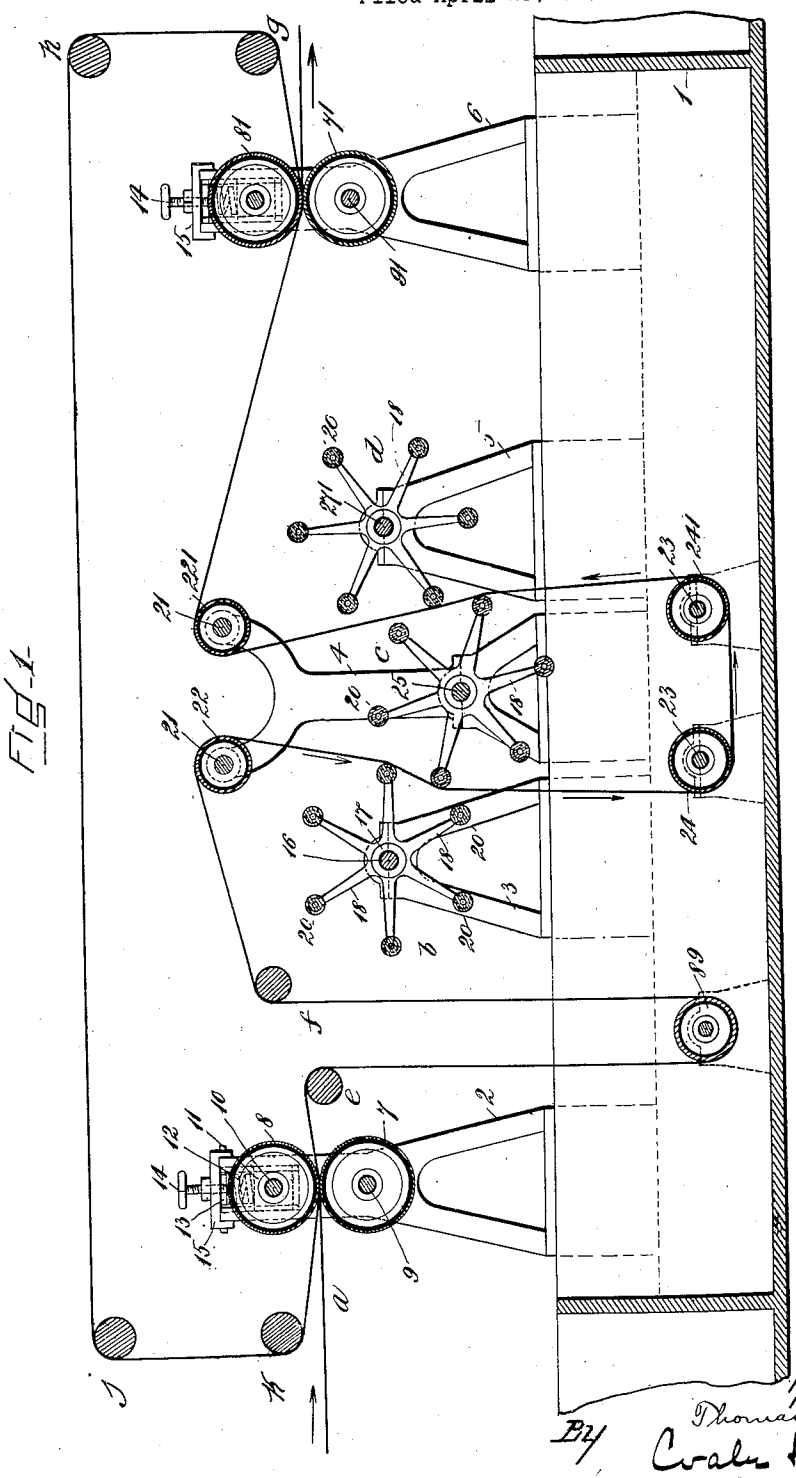

Fig. 1

INVENTOR:
Thomas McConnell
By Coales & Hayes
ATTORNEYS.

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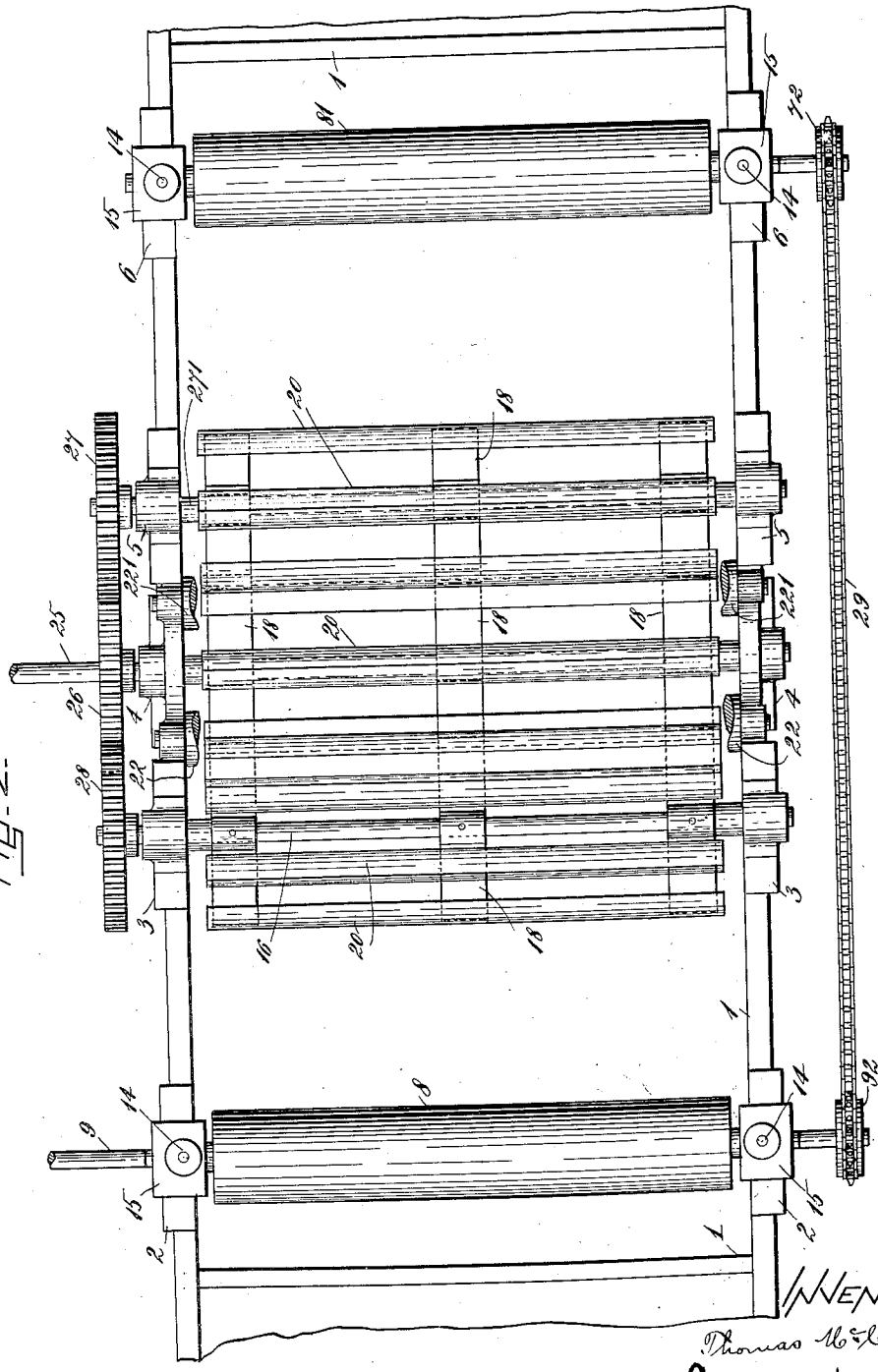

Fig. 2.

INVENTOR:
Thomas McConnell
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ATTORNEYS.

Patented Oct. 6, 1925.

1,555,864

UNITED STATES PATENT OFFICE.

THOMAS McCONNELL, OF EASTHAMPTON, MASSACHUSETTS, ASSIGNOR TO F. COIT JOHNSON, JAMES W. LANE, OLIVER L. JOHNSON, THOMAS McCONNELL, AND HUGH McCONNELL, TRUSTEES, DOING BUSINESS AS HAMPTON COMPANY, OF EASTHAMPTON, MASSACHUSETTS.

MACHINE FOR MERCERIZING YARN.

Application filed April 21, 1923. Serial No. 633,762.

To all whom it may concern:

Be it known that I, THOMAS McCONNELL, of Easthampton, in the county of Hampshire and State of Massachusetts, have invented a new and useful Improvement in Machines for Mercerizing Yarn, of which the following is a specification.

My invention relates more particularly to a machine the characteristics of which may be used for treating yarn, thread or cloth with a liquid, as in mercerizing or glazing it or otherwise.

My invention will be understood by reference to the drawings in which it is shown in its preferred form.

Figure 1 is a longitudinal section through the machine, and

Fig. 2 is a plan, certain guide rolls shown in Fig. 1 being omitted.

1 is a tank on each side of which are mounted frames 2, 3, 4, 5 and 6. Upon the frame 2 is mounted a power shaft 9 carrying a feed roll 7 above which is also mounted on shaft 10 a pressure roll 8. Shaft 10 is held in blocks 11 movable vertically in a slide in the upper part of the frame 2. On the block rests a spring 12 and follower 13. 14 is a screw provided with a suitable handle, this screw passing down through a cap 15 attached to the top of the frame 2, this construction being such that the turning of the screw 14 will adjust the pressure of the roll 8 on the feed roll 7 and the yarns *a* so that the yarns will be properly fed. Guide rolls *e* and *f* suitably supported are provided over which the yarn passes down under roll 89 over roll *e* mounted in the tank and below the level of the liquor, and up over roll *f*. In the frame 3 is mounted a shaft 16 which carries a spider *b*. This spider as well as the other spiders *c* and *d* below referred to comprises a sleeve 17 on which are mounted arms 18, each having a roll 20 attached thereto. The rolls 20 are made of such material, preferably a metal, as will not be attacked by the chemical through which the yarns or fabric have been run.

The yarn passes from between the rolls 7 and 8 and a guide roll *e* under the roll 89 in the tank, over the guide roll *f* to the roll 22. Rolls *e* and *f* may be supported in any desired way and roll 89 as shown is supported in uprights in the tank.

The frame 4 carries at its upper end the shafts 21 on each of which is mounted an idler roll 22, 221, and in the tank 1 and below the level of the chemical are mounted two shafts 23 in any convenient way, on each of which is also mounted an idler roll 24, 241 to serve as a guide to the material. The frame 4 also carries a shaft 25 which is connected with a source of power and carries a gear 26 meshing with gears 27, 28, gear 28 being upon shaft 16 and gear 27 being upon shaft 271 mounted in frame 5. By this means it will be noted that the three spiders shown in Fig. 1 will be rotated. The shaft 25 and the shaft 271 both carry spiders *c* and *d* identical in construction with the spider *b* mounted on shaft 16, and the spiders are preferably set on their shafts so that each pair of rolls of one spider will pass between the opposing rolls of the adjacent spider as the spiders are rotated.

The frame 6 carries rolls 71, 81 identical in character and structure with the rolls 7 and 8. The shaft 91 of roll 71 carries at its outer end a sprocket 72 which is connected by a chain 29 with a sprocket 92 on shaft 9, which is connected with a source of power.

The path of the yarn which may be a series of warp yarns extending across the width of the rolls, will be easily understood by reference to Fig. 1. It is drawn by the rolls 7 and 8 from a source of supply and then passes over rolls *e* and down into the tank and under the roll 89 where it is saturated with the chemical, then up over roll *f* and roll 22 down between two of the spiders *b* and *c*, under the rolls 24, 241 in the chemical, and up between the spiders *c* and *d*. From thence it passes as shown over the roll 221 and out between the rolls 71 and 81. Usually it is desirable to pass the yarn or cloth through the chemical more than once and for this purpose I provide other guide rolls *g*, *h*, *j* and *k* suitably supported, and the yarn passes between 71 and 81 and over the rolls *g*, *h*, *j* and *k* and again

through the tank as before, and over the roll 221 a second time out between the rolls 71 and 81 for further treatment as desired.

It is well known that in mercerizing, the yarn is inclined to shrink. This machine passes the yarn through the liquor always in stretched condition. Its tension may be regulated by regulating the relative speeds of the rolls 71 and 81 to prevent undue strain upon the yarn and the spider system. The speed of the rolls 71, 81 may be changed by changing the sprocket 72 to one of different diameter or by any of the well known automatic devices of the kind which operates when more than a given strain is applied to the yarns.

The spiders by their interlocking and in cooperation with the feed and withdrawal rolls keep the yarn always taut or stretched. I do not mean to limit the number of spiders or arms to the number shown.

What I claim as my invention is:—

1. The machine above described comprising a tank, means for feeding the material to be treated into said tank under tension, and means for withdrawing it therefrom while still under tension, whereby said material will be maintained in stretched condition while in said tank, said feeding and withdrawing means comprising a series of rotating spiders having interlocking arms.

2. The machine above described comprising a tank, means for feeding the material to be treated into said tank under tension and means for withdrawing it therefrom while still under tension, whereby said material will be maintained in stretched condition while in said tank, said feeding and withdrawing means comprising a series of rotating spiders having interlocking arms, each arm having a roller attached to its outer end.

3. A machine for treating a fibrous material comprising a tank and means for passing the material through the tank, whereby it will be given a preliminary treatment, and means for passing the material through the tank a second time, means for longitudinally stretching the material located to act upon the material between said preliminary and said subsequent treatment thereof, and a second means for stretching the material located to act upon said material after the second treatment.

4. A machine for treating a fibrous material comprising a tank and means for passing the material through the tank, whereby it will be given a preliminary treatment, and means for passing the material through the tank a second time, means for longitudinally stretching the material located to act upon the material between said preliminary and said subsequent treatment thereof, a second means for stretching the material located to act upon said material after the second treatment, and means for withdrawing said material under tension after it has been treated and stretched, whereby it will be delivered from the machine while still in stretched condition.

THOMAS McCONNELL.