

No. 648,275.

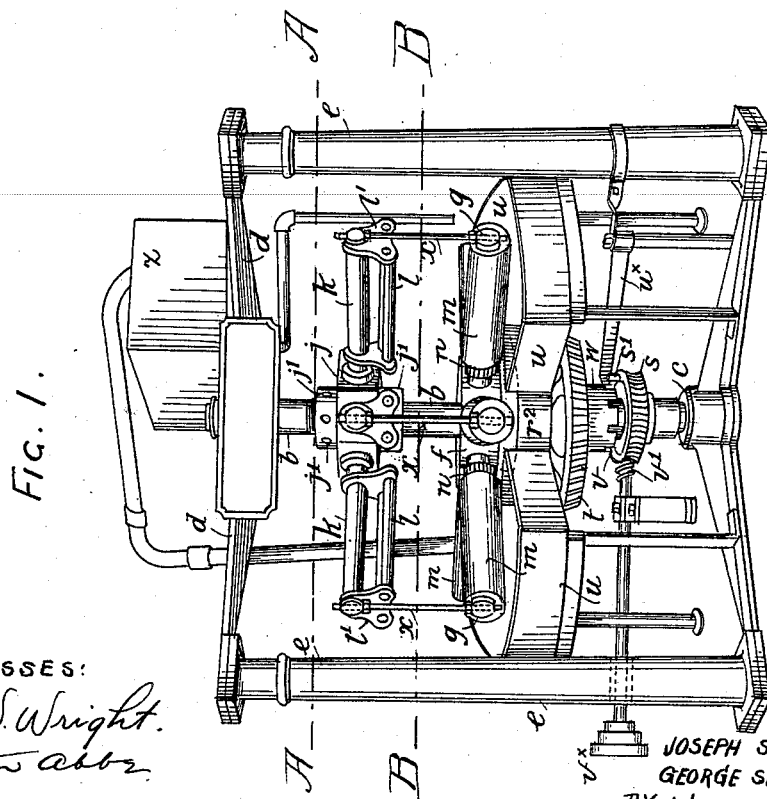
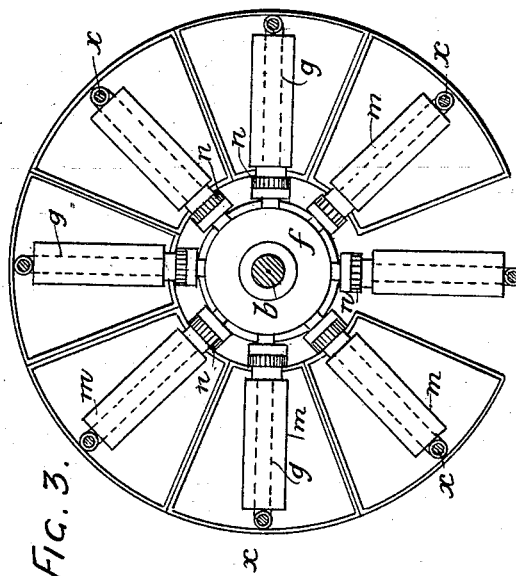
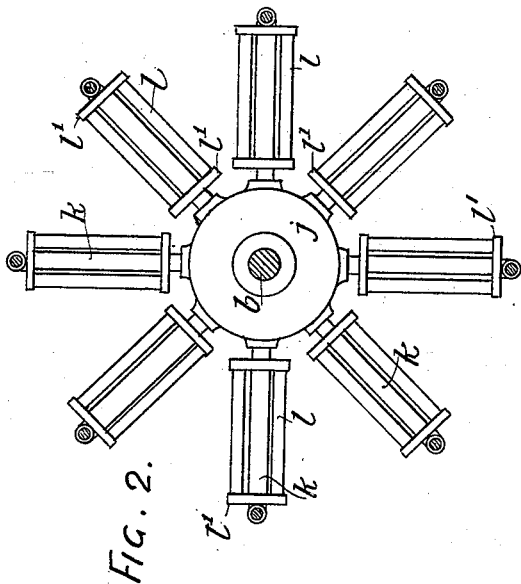
Patented Apr. 24, 1900.

J. S. & G. S. LORD.  
APPARATUS FOR MERCERIZING, &c.

(Application filed Dec. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:  
*P. W. Wright.*  
*M. W. Allen.*

INVENTORS  
JOSEPH SPENCER LORD  
GEORGE SPENCER LORD  
BY *H. W. Lord and H. W. Lord*  
THEIR ATTORNEYS.

No. 648,275.

Patented Apr. 24, 1900.

J. S. & G. S. LORD.  
APPARATUS FOR MERCERIZING, &c.

(Application filed Dec. 27, 1899.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 4.

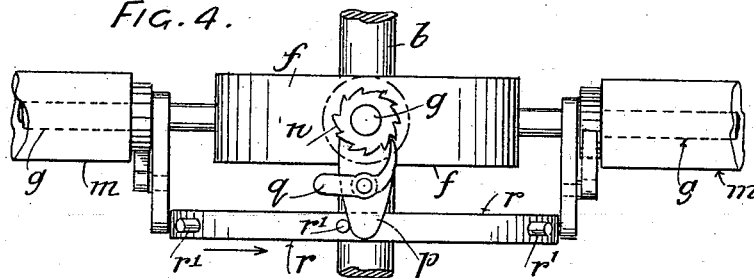


FIG. 5.

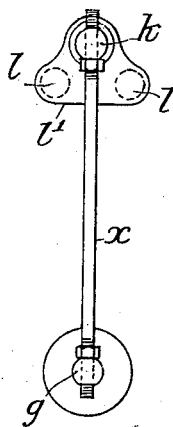


FIG. 6.

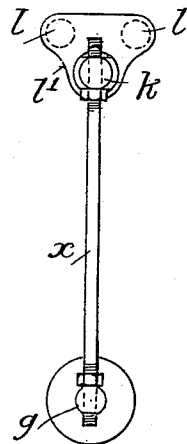


FIG. 8.

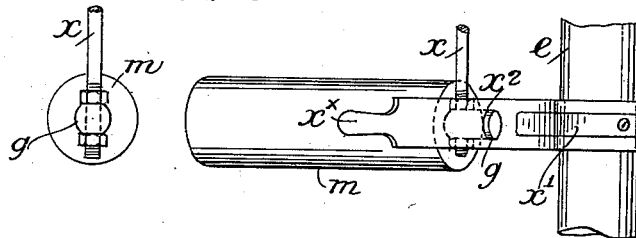
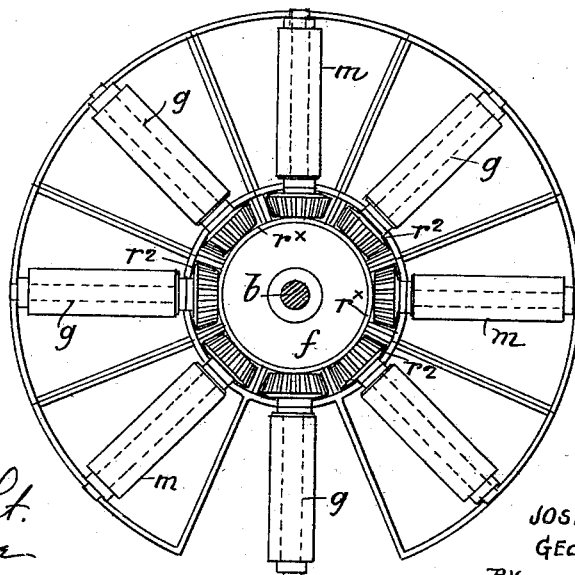


FIG. 7.



WITNESSES:

P. W. Wright.  
M. W. Abbott

INVENTORS  
JOSEPH SPENCER LORD  
GEORGE SPENCER LORD

BY  
Howm and Howm  
THEIR ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JOSEPH SPENCER LORD AND GEORGE SPENCER LORD, OF WHITEFIELD,  
ENGLAND.

## APPARATUS FOR MERCERIZING, &c.

SPECIFICATION forming part of Letters Patent No. 648,275, dated April 24, 1900.

Application filed December 27, 1899. Serial No. 741,728. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH SPENCER LORD and GEORGE SPENCER LORD, subjects of the Queen of Great Britain, residing at Whitefield, near Manchester, in the county of Lancaster, England, have invented a new and useful Improved Machine for Mercerizing, Sizing, or Dyeing Yarns and for Like Uses, of which the following is a specification.

This invention relates to an improved construction of machine for mercerizing, sizing, or dyeing hanks of yarn and for like uses.

According to this invention a machine is constructed with two sets of horizontal rollers superposed and radiating from a central vertical shaft. Hanks of yarn that are to be treated are placed on said superposed rollers, which are caused to revolve and also to move around intermittently, each set coming successively and remaining for a short period, or as long as may be necessary, opposite an attendant, who always remains in one position. During the period of intermittent stoppage the attendant removes the yarns that have been treated in the manner hereinafter described, while the rollers have been traveling around the machine, and places other material on the rollers, which then pass forward, the next set of rollers coming opposite the attendant, and successively in like manner.

In the accompanying sheets of drawings, Figure 1 is a front view of the machine to which we have hereinbefore referred. Fig. 2 is a sectional plan view on line A A. Fig. 3 is a sectional plan view on line B B. Fig. 4 is an end view of bottom roller in Fig. 1, showing rotating device. Fig. 5 is an end view of top and bottom rollers, showing the position of said rollers when placing the yarn thereon. Fig. 6 shows the same rollers in the position for keeping the yarn stretched during treatment. Fig. 7 is a plan of bevel-gearing that may be employed in place of the device shown in Fig. 4. Fig. 8 is a stop mechanism.

For the purpose of this invention we erect a vertical shaft *b*, whose lower end rests on a foot-step *c* and the upper end is supported in a bracket *d*, suitably stayed by arms extending and secured to pillars, as *e*, placed around the machine or other preferred supports. We affix to said vertical shaft, about midway be-

tween the bottom and the top of the shaft, a block, as *f*, from which any preferred number of radial arms *g* project in a horizontal direction. We fit on the same vertical shaft at a convenient distance above the block *f* a second block *j*, that is adjustable in height by a portion of the shaft *b*, having a screw-thread formed thereon, and the nuts *j'*, placed above and below the block *j*. Radial arms *k*, corresponding in number and position to the arms *g*, project from the block *j*. We place at each end of each of the upper radial arms *k* a bracket *l*, preferably triangular, between which rollers *l* are fitted, that are capable of being revolved, and either or both of said rollers may be eccentric. We place a roller *m* of larger diameter on each of the radial arms *g* and retain both the upper rollers *l* and the lower rollers *m* parallel by a vertical rod *x* when the yarn during treatment is stretched between said rollers. We fit on the inner end of each of said rollers a ratchet-wheel *n*. A tongue *p* is fitted on each of the radial arms *g*, and a pawl *q* is pivoted to said tongue. We place a disk *r* on the shaft *b*, but not keyed thereto, and at a little distance below the block *f*. Said disk is provided with a suitable number of studs *r'*, projecting from the periphery, so as to engage with the tongue *p*. The boss of the aforesaid disk is extended on the under side to form a sleeve *r<sup>2</sup>*, on which either a worm-wheel or a bevel-wheel *t*, as shown, is secured, that is actuated by a worm or pinion fitted on a cross-shaft (not shown) which carries a driving-pulley. At the outer end of said cross-shaft a cone-pulley is fixed, which is connected by a strap to a cone-pulley, as *v<sup>x</sup>*, fixed on a transverse shaft having a worm *v'* thereon, that gears into a worm-wheel *s*, which runs loosely on the vertical shaft *b*. A stud *s'* is fixed on the upper side of the worm-wheel *s*, which engages with the spring *u<sup>x</sup>* as the wheel *s* revolves and releases the free end of said spring from the notches *v*, formed on a collar *w*, fixed on the lower portion of the vertical shaft *b*, the opposite end of the spring being attached to the framework of the machine. A tank, as *z*, for containing the liquor is placed in a convenient position above the machine, from which the liquor is conveyed by a pipe and sprayed onto the yarn. The

liquor that runs off or is pressed out of the yarn is collected in troughs *u*, placed under the aforesaid radial rollers, and may be returned to the tank by means of a suitable pump.

In applying our invention the attendant, who always remains at the front of the machine, adjusts the distance between the rollers *l* and *m* by means of the nuts *j'* to suit the length of the hanks of yarn intended to be treated and turns down the brackets *l'*, that are on the nearest upper radial arm, so that the roller or rollers which are supported by said brackets are for the time suspended loosely under the radial arm, Figs. 1 and 5. The yarn or material to be treated is then placed over the radial bar and over the bottom roller and the brackets *l'* turned up; Fig. 6, so that the rollers *l* may come over the radial arm *k*, thereby placing the yarn or material in tension on the rollers. As the stud *s'* on the worm-wheel *s* travels around it comes into contact with and presses the free end of the spring *u* out of one of the notches *v* in the collar *w*, and the friction of the several parts of the machine causes the vertical center shaft when released from the aforesaid spring to be moved around with the blocks and radial bars hereinbefore described one-eighth of a revolution if eight radial arms are employed or in the same proportion with a greater or less number of radial arms. When the free end of the spring *u* falls into the next notch, the succeeding set of radial rollers will have traveled around and stop opposite the attendant. The disk *r* is constantly moved around by the bevel-gearing *t*, that is connected with the driving-pulley; but the rollers on the lower radial arms revolve only when a stud *r'* engages with the tongue *p* and actuates the ratchet-wheel *n*. The radial rollers do not revolve during the period that the vertical shaft is revolving, the vertical shaft and the radial rollers revolving alternately. The yarn or material is subjected to treatment by the liquor being sprayed onto the yarn either at the first stoppage after being placed on the rollers or at two or more stoppages, and at a succeeding stoppage before again arriving in front of the attendant the superfluous liquor is squeezed from the yarn by an india-rubber roller placed so that the lower rollers may come into contact therewith. The yarn may then be treated with an acid and subsequently washed with water, which is squeezed from the yarn at the last stoppage previous to arriving opposite the attendant, who then removes the yarn from the rollers by turning down the brack-

ets *l'* and places fresh material thereon in the manner hereinbefore described.

The liquor may, if preferred, be applied to the yarn by the lower rollers being partly submerged in the troughs *u* in place of being sprayed onto the material.

When the machine is employed for sizing, a wire or a bristle brush is placed over and parallel with the upper rollers. In place of the disk *r*, tongue *p*, and ratchet-wheel *n* we may employ bevel-gearing, as shown in Fig. 7, for actuating the radial rollers. The bevel-wheel *r<sup>x</sup>* is placed on the vertical shaft in the same manner as the disk *r*, and a bevel-pinion *r<sup>2</sup>* is fitted on the inner end of each of the bottom rollers *m*.

If it is preferred to cause the rollers to stop opposite the attendant by hand and not automatically in the manner hereinbefore described, we dispense with the worm-wheel *s*, the spring *u<sup>x</sup>*, the grooves *v*, and the gearing connected therewith and employ the device shown in Fig. 8. *x'* is a hand-lever which is pressed inward by a spring *x'* and has a hole *x<sup>2</sup>*, in which the outer end of a radial arm enters and remains until it is disengaged by the attendant pulling the lever outward.

We claim as our invention—

1. A machine for mercerizing, sizing or dyeing yarns and for like uses, and comprising a central vertical shaft, having two sets of superposed radial arms, as *k* and *g* radiating from said shaft, in combination with an adjustable block as *j* carrying the upper set of arms, swivel-brackets as *l'* on said upper arms for supporting a roller or rollers either above or below the radial arm, a roller on each of the lower radial arms, means for rotating the lower rollers, mechanism for causing each set of arms and rollers to come successively opposite the attendant, and suitable tanks and troughs for supplying and receiving the liquor, all substantially as hereinbefore described.

2. In a machine for mercerizing, sizing or dyeing yarns and for like uses, the combination of a central vertical shaft with two sets of radial arms thereon, one set of arms having swivel-brackets *l'* each for supporting a roller or rollers either above or below the arm, as and for the purpose described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSEPH SPENCER LORD.  
GEORGE SPENCER LORD.

Witnesses:

J. W. HUGHES,  
J. ERNEST HUGHES.