

No. 724,626.

PATENTED APR. 7, 1903.

C. STUART.

## MACHINE FOR LUSTERING SILK.

APPLICATION FILED JUNE 13, 1902.

NO MODEL.

2 SHEETS--SHEET 1.

Fig. 1.

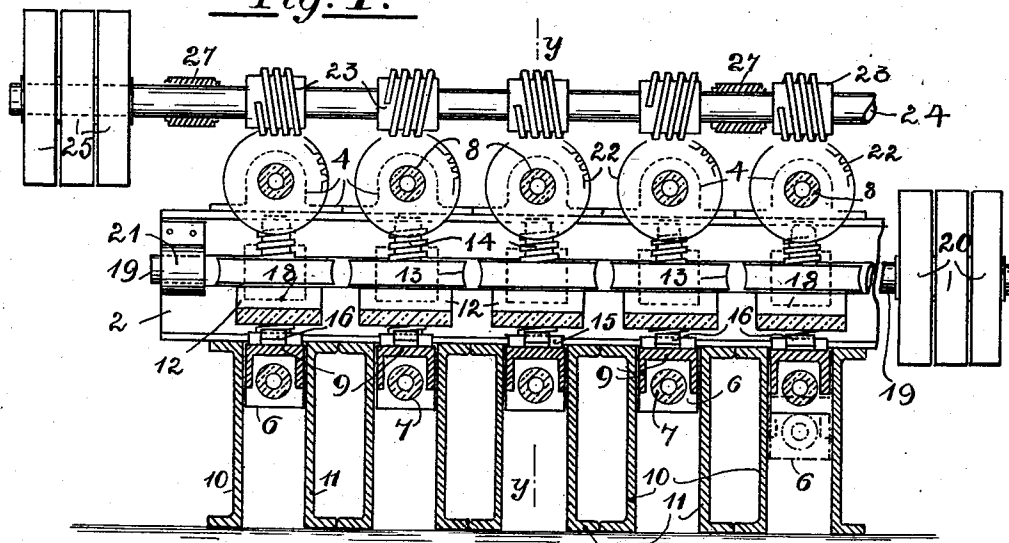
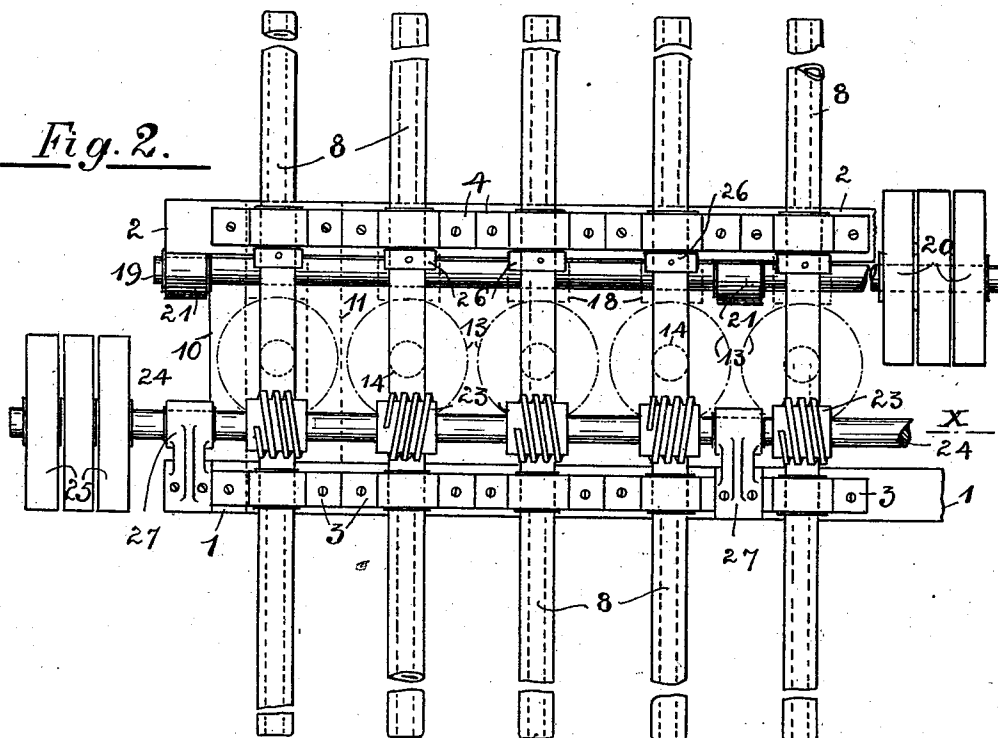


Fig. 2.



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Fig. 3.

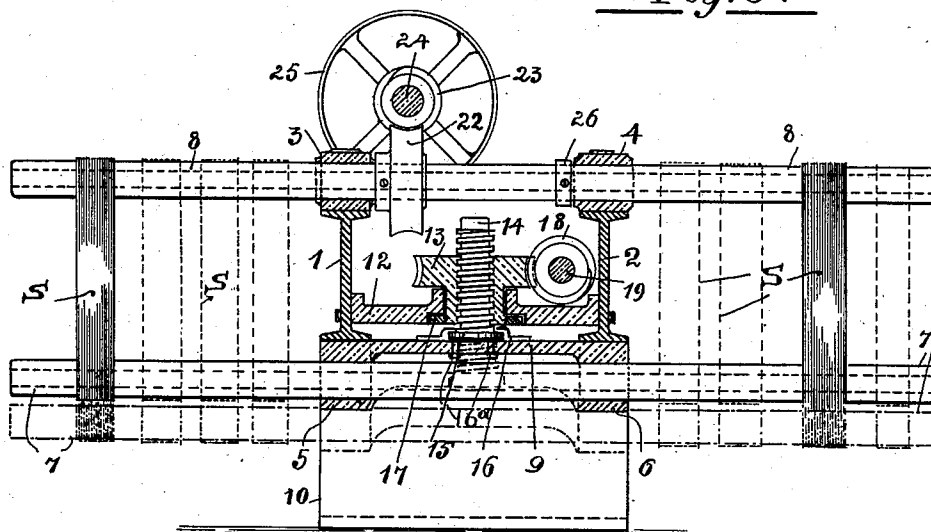
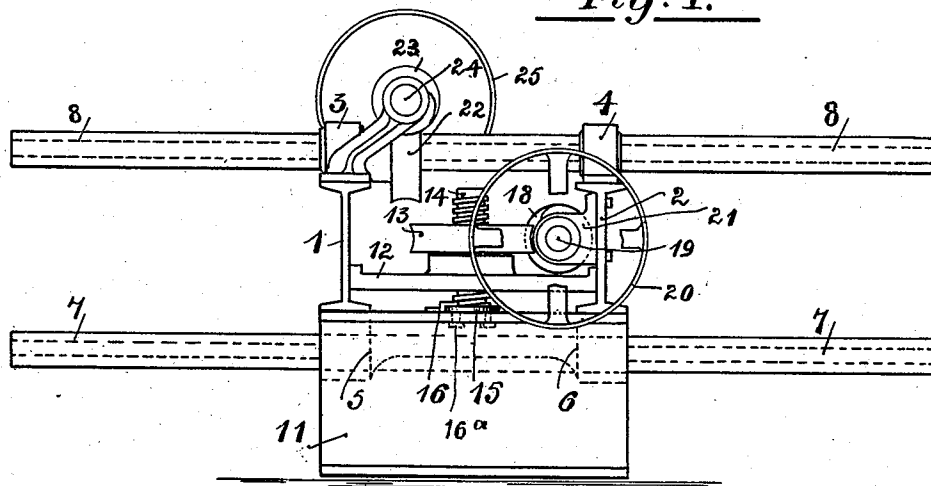


Fig. 4.



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# UNITED STATES PATENT OFFICE.

CHARLES STUART, OF PATERSON, NEW JERSEY.

## MACHINE FOR LUSTERING SILK.

SPECIFICATION forming part of Letters Patent No. 724,626, dated April 7, 1903.

Application filed June 13, 1902. Serial No. 111,436. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES STUART, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Machines for Increasing the Luster of Silk, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The object of my invention is to provide a machine that will give to silk fiber an increased brilliancy, which will enhance the luster of the fabric into which it is woven, and which will be adapted to receive the damp  
15 skeins of silk as they are taken from the hydro-extractor, after dyeing, on smooth heated metallic rollers to stretch the fiber while damp, prevent the shrinking thereof while drying, that will maintain them in a stretched  
20 condition and simultaneously cause the skeins to be gradually revolved, passing around the said rollers in a spread-out condition while being dried to calender the fiber and produce a uniformity in the luster thereof.

25 In the accompanying drawings a machine is illustrated which embodies the principles of my invention, although it is capable of modifications, which may be made without departing from the essential elements and scope thereof.

30 In the drawings, Figure 1 is a sectional view on the line X X in Fig. 2, showing means for suspending, revolving, and stretching skeins of wet silk and for maintaining them in a stretched condition to prevent shrinking while being revolved and dried. Fig. 2 is a plan view of said machine. Fig. 3 is a sectional view on the line y y in Fig. 1, and Fig. 4 is an end view of the machine.

40 The skeins of damp silk are taken from the hydro-extractor, into which they are placed when taken from the dye-tubs, and are spread out on and around a pair of rollers 7 and 8, which are metal nickel-plated, preferably hollow. Both of said rollers are  
45 mounted to rotate in suitable bearings, but the upper roller 8 is mounted in bearings 3 and 4, which are secured to the upper part of the I-shaped uprights 1 and 2, while the lower roller 7 is mounted in the journals 5 and 6 in the downwardly-projecting portions of the inverted-U-shaped bridge 9, which is adapted to slide vertically between the legs 10 and

11, which in sets of two or pairs form a guide for the combined bearings 5 and 6 and the lower roller 7 when the silk is being stretched or slackened preparatory to the removal thereof from the rollers after being dried. The bearings 5 and 6 of the lower roller 7 are raised or lowered by means of the screw 14, which passes through the worm gear-wheel 13 and has its head 15 secured to the bridge 9 by clamps 16 and screws 16<sup>a</sup>. The worm-gear 13 is turned by the worm 18 on the shaft 19 and is prevented from rising by the lock-nut 17, which is secured to its lower end and turns in the support 12, secured to the I-shaped beams or uprights 1 and 2. The screw 14 is therefore free to be raised and lowered, according to the direction in which the worm-gear is turned, and the screw 14 being secured to the bridge 9 said bridge and the bearings 5 and 6 in which the lower roller 7 is carried are raised or lowered accordingly.

75 The shaft 19 is driven from a set of pulleys 20, the two outside pulleys being loosely mounted and the center one being secured thereon. One of said loose pulleys may thus be utilized to carry when idle a straight belt and the other a cross-belt, so that the shaft may be driven in either direction as and when required in its bearings 21.

A pair of rollers, an upper and a lower one, are capable of carrying a great many skeins of silk, and when the skeins have been placed around and spread out upon them and the shaft 19 is driven in the proper direction the lower roller 7 or the whole series of lower rollers 7 are forced downwardly until the skeins are stretched to the desired extent, in which condition they are held and prevented from shrinking. While thus held the skeins of wet silk have a rotary motion imparted to them, power being communicated to the driving-shaft 24. A rotary motion is imparted, through the worm 23 on said shaft, to the worm-gears 22, each of which is secured to one of the upper rollers 8, thereby causing the upper rollers to turn in their respective bearings, and owing to the tightness of the silk around the upper and lower rollers the lower rollers are also caused to turn in the same direction as the upper rollers. A continued revolution is thus imparted to the skeins of silk and in the same direction in which the

rollers are turning, so that in the successive revolutions of the skeins of silk every portion of the skein is brought into mediate or immediate contact with the smooth heated surface of the rollers.

The rollers may be heated to the proper temperature in any suitable manner, and the wet silk may be placed thereon, stretched, prevented from shrinking, and revolved until dry.

With this description of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for increasing the luster of silk, the combination of an upper and lower roller between which the silk is stretched, with a frame, upon which the said rollers are mounted to project beyond the sides thereof, a worm-wheel secured to one roller, a stationary bearing for said roller, a shaft provided with a worm to engage said worm-wheel and drivesaid roller, a vertically-adjustable frame provided with bearings supporting the other roller, a screw secured to said movable frame, a worm gear-wheel on said screw, means for locking said worm gear-wheel to prevent a vertical movement thereof, a shaft provided with a worm to engage and turn said worm gear-wheel in opposite directions, means for driving said last-mentioned shaft and means for rotating said first-mentioned shaft, substantially as set forth.

2. In a machine for increasing the luster of silk, a plurality of rotating calendering-cylinders arranged in pairs, each pair comprising an upper and a lower cylinder between which the silk is stretched and prevented from shrinking, a worm-wheel secured to the upper cylinder of each pair, the frame carrying said cylinders and arranged so that the cylinders project beyond both sides thereof, stationary bearings for the upper cylinders, a driving-shaft provided with a series of worms engaging the worm-wheels on the upper cylinders, and means for rotating the same, in combination with a series of vertically-adjustable carriages provided with bearings for the lower cylinders, (guides in which said carriages move,) a screw secured on the top of each of said carriages, a series of worm-wheels threaded to turn on said screws and mounted in the frame so as to be limited to a rotating movement in either direction around said screws, a shaft, provided with worms to engage with the worm-wheels on the screws of the vertically-movable carriages, and means for rotating the last-mentioned shaft, substantially as set forth.

3. In a machine for increasing the luster of silk, the frame, a plurality of calendering-cylinders arranged in pairs of equal length comprising an upper and lower cylinder, between which skeins of wet silk are stretched and prevented from shrinking while being dried, and which overhang or project beyond both sides of said frame, a worm-wheel secured to the upper cylinder of each pair,

stationary bearings for the upper cylinders, and a driving-shaft suitably mounted in said frame and provided with a series of worms which engage with the worm-wheels on said upper cylinders, and means for rotating said driving-shaft, in combination with a series of vertically-adjustable sliding carriages provided with bearings for the lower cylinders, guides for said carriages and means for raising and lowering said carriages, substantially as set forth.

4. In a device for increasing the luster of silk, the combination of a frame, a series of horizontal calendering-rollers mounted to rotate in said frame with the free ends thereof overhanging or projecting beyond the sides of said frame, said rollers being adapted to hold, and rotate skeins of wet silk stretched between each pair, stationary bearings for the upper roller of each pair, vertically-movable bearings for the lower roller of each pair, and means connected to the movable bearings for stretching the wet skeins and for preventing the shrinking thereof while drying, and means for rotating the upper roller of each pair, substantially as set forth.

5. The combination with the frame, carrying upper and lower calendering-rollers of equal length, and arranged in parallel bearings, of such rollers centrally supported by, and having their extremities projecting beyond the sides of, said frame, to hold and rotate skeins of stretched wet silk, fixed bearings for the upper rollers, inverted-U-shaped vertically-movable bearings for the lower rollers, guides for said movable bearings, means for operating said vertically-movable bearings, means for locking said movable bearings to prevent the shrinking of the silk while drying, means for revolving said upper rollers, and transmitting said motion to the lower rollers by means of the tension of the skeins, to rotate the skeins of silk while being dried, continuously over and around said calendering-rollers, substantially as set forth.

6. The frame, having stationary bearings, calendering-rollers mounted to turn therein, and means for rotating said rollers, in combination with a series of inverted-U-shaped vertically-movable carriages having bearings therein, vertical guides for said carriages, calendering-rollers mounted to turn in said bearings, screws secured to said carriages, the brackets, internally-threaded worm-wheels adapted to turn in said brackets, lock-nuts securing said wheels against vertical movement in said brackets, shaft, worms secured thereto to engage said worm-wheels, and means for rotating said worm-shaft in opposite directions, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES STUART.

Witnesses:

LOUIS A. PIAGET,  
JOHN F. KERR.