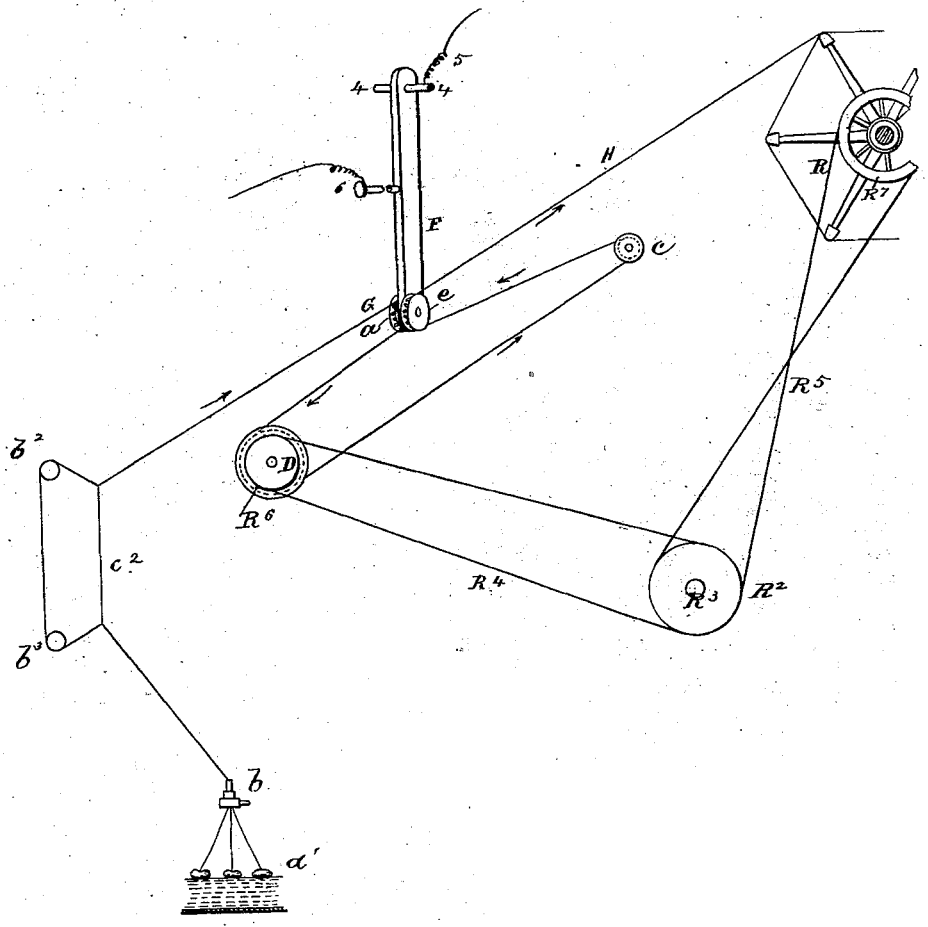
(No Model.)

E. W. SERRELL, Jr.

SILK REELING MACHINERY.

No. 334,621. Patented Jan. 19, 1886.



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SILK-REELING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 334,621, dated January 19, 1886.

Application filed April 23, 1884. Serial No. 129,024. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. SERRELL, Jr., of the city, county and State of New York, United States of America, but temporarily residing at Chabeuil, in the department of Drôme, Republic of France, have invented an Improvement in Silk-Reeling Machinery, of which the following is a specification.

Reference is hereby made to my French Patent No. 147,624, deposited February 25, 1882, and granted May 9, 1882; my Austrian Patent, dated May 17, 1882, No. 10,629; my German Patent of March 28, 1882, No. 19,885, and my corresponding United States application No. 129,196, filed April 25, 1884, and to my United States application No. 129,021, filed April 23, 1884, in order that the general features of my automatic silk-reeling machine may be understood.

In the machine shown in my said applications the filaments from several cocoons in a water-basin are gathered together and passed through a filament-attaching device, which consists of a revolving cylinder, usually containing a perforated agate, through which the thread of filaments is passed. The thread, after leaving the filament-attaching device, passes around a feeding-drum, then makes what is known as the "croisure," then passes over a pulley upon a regulating-lever, and thence goes to the reel, upon which it is wound. This reel is revolved at a greater circumferential speed than the feeding-drum; hence the thread is stretched a certain amount, and so long as the thread is of the required size and strength the tension of the thread keeps the regulating-lever from closing an electric circuit. If the thread falls below the required size, it becomes weaker; hence the pull of the thread upon the regulating-lever is less, and the lever moves and closes an electric circuit, which contains an electro-magnet, that brings into action devices that partially revolve a cocoon-holder and bring an additional cocoon-filament into position to be taken by a hook on the filament-attaching device, which hook wraps the filament upon the running thread, thereby increasing the strength of the thread and giving it the necessary resistance to move the lever and break the electric circuit. As the varying tensions to which the silk is exposed before it reaches the feeding-drum are likely to be reproduced to a certain extent between the feeding-drum and the reel, and thus interfere with the regular action of the machine, I have found it desirable to compensate or neutralize the varying tensions to which the thread is exposed before reaching the feeding-drum. These varying tensions arise from the following causes: first, the cocoons may be unequally cooked and softened, therefore the filaments may unwind from them with varying tensions on account of the differences in resistance experienced by the filaments in unwinding; second, the friction experienced by the thread in passing through the agate of the filament-attaching device, and also in drawing through the croisure or drying device vary materially with the cleanliness of the apparatus and the condition of the silk; third, the resistance experienced at the small pulleys around which the thread passes varies from time to time, according to whether or not their journals are oiled and cleaned or the reverse; fourth, the resistance caused in the croisure or drying device varies enormously, according to the condition of the cocoons, the temperature of the water, the nature of the silk, the number of crossings of the threads in the croisure given by the reeler, and from other causes.

In my application, No. 129,022, filed April 23, 1884, I have shown the croisure as being between the filament-attaching device and the feeding-drum; but the thread, after leaving the croisure, passes directly to said feeding-drum. In my present improvement the croisure is made between the filament-attaching device and the feeding-drum; but the thread, after leaving the croisure, instead of going direct to said feeding-drum, first passes around a small pulley upon the regulating-lever, then to the feeding-drum, then around a fixed roller or pulley and these around a second pulley upon the regulating-lever, and finally to the winding-up reel. By this arrangement of parts and lead of the thread the varying tensions existing in the threads arising from drawing the thread through the croisure and otherwise before reaching the feeding-drum are neutralized, as hereinafter explained, so that the regulating-lever is only affected by the tension resulting from variations in the size of the thread.

In the drawings I have represented my in-

vention by a diagram. The cocoons at a' are in a water-basin, and the filaments of said cocoons are gatherd together and pass through the agate of the filament-attaching device b. The thread, after leaving the filament-attaching device b, makes the croisure at c^2, and then passes around a small pulley, a, upon the lever F, thence to the feeding-drum D, around which it makes one or more turns. Then the thread goes around the fixed pulley c to the small pulley e on said lever F, and from e the thread passes to the reel R, upon which it is wound. The croisure is made by passing the running thread after it leaves the filament-attaching device over the roller b^2, then down around the roller b^3, and then making several turns of the free end of the thread around that part of the thread between b^3 and b^2, and then the thread is led to the pulley a, as aforesaid. The lever F moves upon a pivot, 4, and the pulleys a e or "tavellettes," as they are some times called, are at the lower end of said lever and upon opposite sides thereof. This lever F corresponds to the regulating-lever of my said applications. The feeding-drum D and reel R are revolved by means of the shaft R^3 and pulley R^2 through the belts R^4 R^5 and pulleys R^6 R^7. The shaft R^3 may be the driving-shaft of the machine. It is to be borne in mind that the circumferential speed of the reel is greater than that of the feeding-drum; hence there is a constant pull on the the thread, acting to stretch the same between the reel R and the feeding-drum D, and if the thread is of the required size and strength, the tension thereof tends to pull the lever F away from the contact-point 6; but, if the thread becomes weaker, its resistance is less, and the lever makes contact with 6 and closes an electric circuit, which brings into operation the devices that cause a filament to be added to the running thread, as set forth in my aforesaid applications 129,021 and 129,196.

By inspection of the diagram it will be seen that the thread passes to the pulley a on the lever F at an equal angle to, but in a direction opposite to that in which the thread passes from the roller e on said lever to the reel R; hence the lever is solicited in two directions— in one by the tension existing in the thread at the point G, caused by the drum D drawing the thread through the croisure, &c., and in the other by the constant tension by the reel R upon the portion H of the thread, caused by the surface-speed of the reel being greater than that of the feeding-drum D; but as these two tensions solicit or tend to move the lever in opposite directions, the lever F will not be moved in either one direction or the other simply by the forces that draw the thread through the reeling-machine from the filament-attaching device b to the reel R, but only the lever F will be acted upon by variations in the size and strength of the thread between the feeding-drum and the reel R, and these variations in size and strength of the thread act upon the lever F for the purposes before mentioned, so as to close an electric circuit by the lever F when the filament weakens below the standard strength.

I claim as my invention—

The combination, with the feeding-drum D, reel R, and means, substantially as set forth, for rotating said parts, so that the reel is revolved at a greater circumferential speed than that of the feeding-drum, of the pivoted lever F, the rollers e on the lever, and the stationary roller c, the parts being arranged so that the tension of the thread is made to act upon the lever F in opposite directions, for the purposes set forth.

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Witnesses:
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