

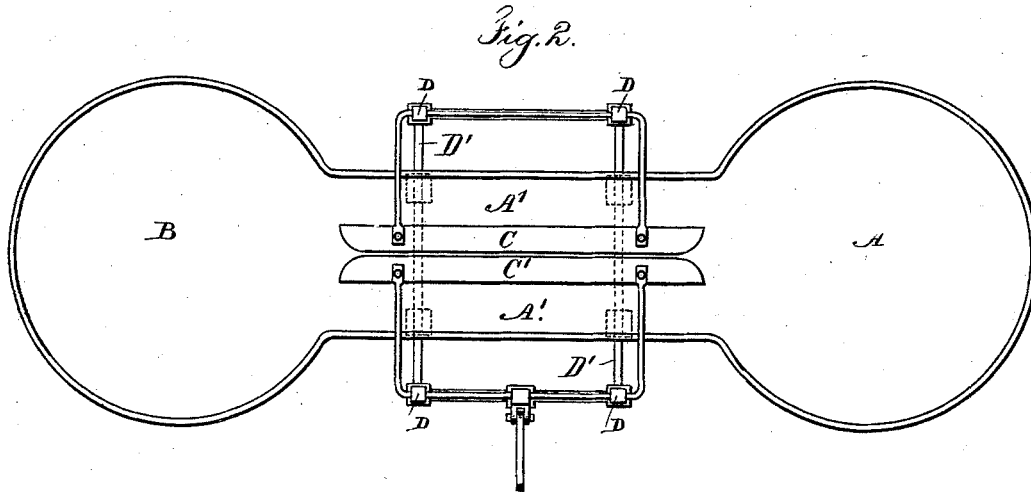
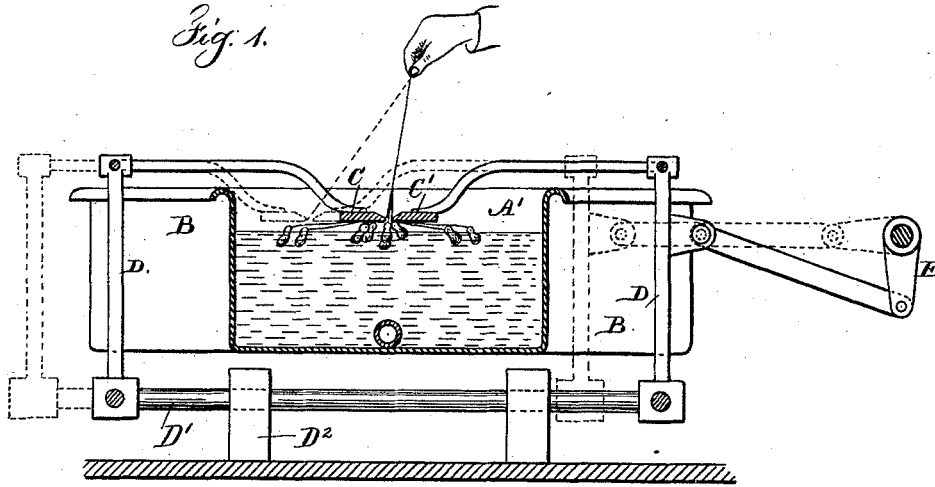
(No Model.)

E. W. SERRELL, Jr.

APPARATUS FOR SEPARATING WASTE FLOSS FROM COCOONS.

No. 399,936.

Patented Mar. 19, 1889.



Witnesses,  
Char. H. Smith  
W. L. Serrell

Inventor  
Edward W. Serrell Jr.  
Per Lemuel W. Serrell

015

# UNITED STATES PATENT OFFICE.

EDWARD WILLIAM SERRELL, JR., OF NEW YORK, N. Y.

## APPARATUS FOR SEPARATING WASTE FLOSS FROM COCOONS.

SPECIFICATION forming part of Letters Patent No. 399,936, dated March 19, 1889.

Application filed July 11, 1887. Serial No. 243,973. (No model.) Patented in France March 14, 1887, No. 182,160; in Italy March 17, 1887, XLIII, 162; in England April 27, 1887, No. 6,121; in Belgium April 27, 1887, No. 77,239; in Germany May 6, 1887, No. 42,313; in Spain June 30, 1887, No. 6,969; in Turkey July 30, 1887, No. 85; in China December 15, 1887; in India December 20, 1887, No. 205, and in Austria-Hungary February 6, 1888, 38/143.

*To all whom it may concern:*

Be it known that I, EDWARD WILLIAM SERRELL, JR., of the city and State of New York, United States of America, but temporarily sojourning at Chabeuil, in the Department of the Drôme, in the Republic of France, have invented an Improvement in the Apparatus for Separating Waste Floss from Cocoons, of which the following is a specification.

Letters Patent have been granted to me for this invention in the following countries, viz: Great Britain, No. 6,121, dated April 27, 1887; France, No. 182,160, dated March 14, 1887; Belgium, No. 77,239, dated April 27, 1887; Italy, Vol. 43, No. 162, dated March 17, 1887; Spain, No. 6,969, dated June 30, 1887; Austria-Hungary, Tome 38, No. 143, dated February 6, 1888; Germany, No. 42,313, dated May 6, 1887; Turkey, No. 85, dated July 30, 1887; China, dated December 15, 1887, no number; India, Register 205 of 1887, dated December 20, 1887.

When the cocoons have been submitted to the preliminary operations employed to soften the gum and to loosen and partially detach the floss, they still have to undergo another operation before they are ready to be reeled—the “débavage,” “purgeage,” or “cleaning.” By the operations of cooking and brushing or their equivalents the outer floss and broken ends are to a greater or less extent loosened from the cocoon, but are not, as a rule, entirely detached from it.

In order that the cocoon may be reeled it is necessary to completely detach the floss and broken ends, so that the true end will appear issuing from compact layers of undisturbed filament. The performance of this work—the cleaning—is an operation heretofore performed by hand and requiring great skill, patience, and labor, without which heavy waste is involved. Every particle of floss or tangled end which is not removed from the cocoon causes delay in the reeling and damage to the whole skein of silk, and the value of every particle which is removed unnecessarily is diminished as a product to a small fraction of its value as silk, because it can

afterward be utilized only as waste. As the cleaning has up to this time been done each cocoon must be delicately taken by the floss and shaken loose. To make a kilogram of silk requires about six thousand European cocoons. Each cocoon with good running averages two brushings and cleanings, so that to reel a kilogram of silk the operative has to clean at least the equivalent of ten thousand cocoons. The labor required is thus very considerable, and it is much more than is supposed if an effort is made to get as much silk as possible.

The following general rules may be considered as governing the operation of cleaning: First, to remove the floss, the best and gentlest means is to agitate the cocoons in hot water while holding the floss near the cocoon; second, the cocoon should be as free to move about as possible while this is being done; third, the water should be boiling; fourth, repeated agitations in the water while the floss is gently pulled off are better than repeated snatchings of the floss from a cocoon at rest upon the water, as usually practiced; fifth, any given cocoon should be exposed to the boiling water for as short a time as possible.

It has hitherto been extremely difficult to carry these rules out practically, because the operative cannot support the heat of the water, into which she is obliged to plunge her fingers, if the water is as hot as it should be, and in any case she can only snatch at the cocoons, stopping each time to cool her fingers in cold water.

I make use of an apparatus consisting of one or several plates or guides supported above the water of the basin, which plates or guides have slits, openings, or edges, against which at a point near the surface of the water the cocoons to be cleaned are held. To this apparatus I impart a motion, preferably horizontal, so that when the ends of the silk of the cocoons are against one edge of one guide, or within an opening between two guides, the cocoons are washed to and fro on the surface of the water, which detaches the remainder of the tangled silk, which tangled silk floss is

pulled up out of the apparatus either by hand or mechanically, and the cocoons are ready to be reeled.

In the drawings, Figure 1 is a vertical section, and Fig. 2 is a plan view, of the apparatus employed by me.

A channel or water-space is provided—as, for instance, the channel A' between the basins A and B. Means are provided for heating the water in this channel and the basins with which it connects. Two plates or guides, C C', are held over the water, parallel and a little apart from one another, by the supports D D, extending to a frame, D', under the basins. This frame is mounted on a slide, D<sup>2</sup>, so that the plates C C' can be laterally moved back and forth across the channel, while maintaining their relative position to one another. Any suitable means—as a crank, E—may be used to produce the motion.

Operation of the apparatus: Uncleaned cocoons are put in one basin. A group of forty or fifty are then taken and portions of their floss slipped between the plates C C'. These plates are kept in constant motion back and forth in a direction at right angles to the line of the opening between them. This movement may be of about eight to ten centimeters in extent, and the crank producing it may be run at about a hundred revolutions a minute, so that the plates have a movement of eight centimeters each way one hundred times per minute, or two hundred movements per minute in all. The simplest way of operating the apparatus is that of drawing in the waste floss by hand. The operative, having slipped the waste floss between the plates, gently pulls upon it, so as to gather it in at the rate of two or three meters a minute. The cocoons, which are under the plates, immediately begin to act differently one from another, according to the state of their floss. Those cocoons which are still surrounded by a mesh of only partially-loosened floss are drawn up close to the opening between the plates, and are washed rapidly back and forth in the water by the motion of the plates, so that the floss quickly becomes loosened and dragged up through the openings between the plates, leaving the cocoon clear. Cocoons which are more nearly clean part with what remains of their floss more easily, and only follow the movements of the plates in part, so as in effect to be only gently agitated one way and the other by the floss following the plates as it leaves the

cocoons. Cocoons which have become thoroughly cleaned give off their ends so freely in the very hot water that they are scarcely affected by the movements of the plates, and in general remain near one or the other side of the channel, yielding the little length of filament required by the pulling of the floss without moving from their place. As the operative continues to pull up the floss, she moves her hands away from the point at which the cocoons enter the channel and toward the other basin. At the end of a certain time the cocoons will be found to be cleaned, and the operative has only to attach the clear filaments which have replaced the floss to a peg at the side of the receiving-basin, drawing the cocoons out from under the plates at the same time, and by the act of drawing the filaments up to the peg the cocoons are now ready to be reeled. It is evident that several groups of uncleaned cocoons may be passed gradually along and through the slot and drawn up progressively in any suitable manner to insure a continuous or nearly continuous feeding.

I claim as my invention—

1. The combination, in an apparatus for separating waste floss from cocoons, of a hot-water basin and guides or plates, against which a portion of the floss is held, and mechanism for giving to the plates a reciprocating motion, so as thereby to move the cocoons in the water and detach the floss, substantially as specified.

2. The combination, with the basin A B and the guides C C', of supports for the same passing above the edge of the basin and holding them in the required position in relation to each other, leaving a free passage from one end to the other of the said guides for the passage of the waste floss, substantially as specified.

3. The combination, with the basin A B, guides C C', and frame-work for the same, of mechanism, substantially as specified, for imparting to the guides the requisite motion during the operation of separating the floss, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD WILLIAM SERRELL, Jr.

Witnesses:

ROBT. M. HOOPER,  
JOS. B. BOURNE.