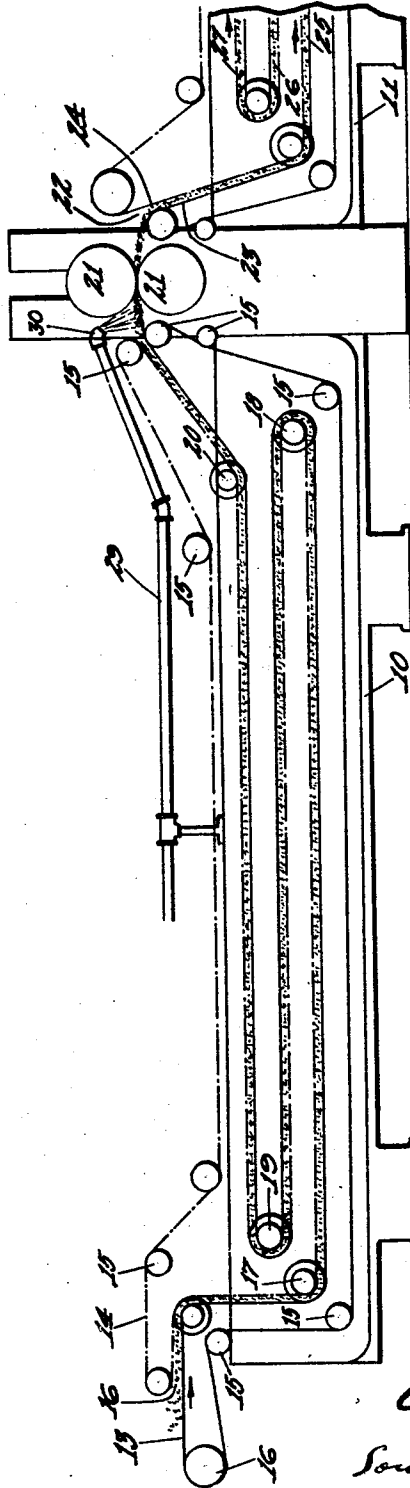


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C. G. SARGENT
SILK WASHING MACHINE

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SILK-WASHING MACHINE.

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This invention relates to the washing and degumming of silk fiber. The principal objects of the invention are to substitute for the slow process of the present day a continuous process of washing silk and to provide a means for conducting the silk through the washing tanks in such a way that the principal part of the dirt which is taken out of the stock on its first traverse of the tank will not mingle with the fresh stock coming into the tank or with any of the stock in the tank during the process and to make this action progressive.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, which is a longitudinal sectional view of a washing tank or bowl showing it connected up with the next one of a series and illustrating the course of the stock through the same.

Silk is now washed by placing it in small bags containing about one pound each and putting these bags in wooden tubs containing a scouring solution. Steam is introduced through steam jets and the mass is manipulated by an attendant by means of a pole with which he agitates it. The bags are removed by hand and then partially dried by hydro-extraction or otherwise. For the purpose of doing away with this antiquated process and modernizing the washing of silk and removing the wax, I provide a series of washing tanks or bowls 10, 11 etc. and place them end to end. In each tank is placed a pair of perforated endless aprons 13 and 14 running over guide rolls at various places. At the intake end of the first tank or bowl the two aprons are guided by their guide rollers 16 at a distance apart and both running in the direction of the arrows at the left so as to receive stock at a point between the rollers 16 and carry it between the aprons throughout the washing operation. At all times one apron passes over a guide roller in contact therewith and the other apron passes over the same roller, but with the stock between them so as to carry it through. Sometimes it is one apron that is in contact with the guide roller and sometimes it is the other.

In this case the stock passes down between the two aprons to a lower roller 17 which they pass around with the stock between them. The first washing operation takes

place during the passage of the stock along the bottom of the tank between the aprons from the guide roller 17 to the guide roller 18. As the stock is loaded with impurities it is natural that the heaviest ones and those most easily discharged will be separated from the stock in its passage along the bottom of the tank between the two rolls 17 and 18. When the stock reaches the roll 18 it is considerably cleaned and has much less proportion of impurities in it than when it entered. It then goes between the aprons from the roll 18 to a roll 19 at the intake end at a higher level and then back again to a roll 20 and is discharged between the two aprons where they extend upwardly and directed into the press rolls 21. The two aprons then separate and the return strands are guided back by rolls 15, one over the tank and the other under the rolls 17 and 18 in the bottom of the tank.

It will be observed that the stock passes back and forth in the tank three times in the present case and that heavy impurities from the incoming stock cannot be discharged into the water and precipitated on the stock that is already cleaned or partly cleaned. Furthermore any of the lighter impurities that are deposited by the two upper strands of the aprons and that fall on the lower strand have a chance to be discharged again as the apron passes upwardly through the tank. This is a point that has not been given consideration before as far as I am aware and is a very important feature in the cleaning of this particular stock on account of the condition of the impurities. Most of the dirt and gum is taken out during the travel of the aprons on the bottom strand thereof and deposited throughout the length of the bowl directly on the bottom of the bowl from which it is removed in any way that is common in this kind of washing bowls or tanks. The return strand of the lower apron does not materially impede the deposit of the impurities on the bottom as of course they pass freely through the screens of which it is made up.

From the squeeze rolls 21 a continuous mass of stock is introduced into a space 22 between two other aprons 23 and 24 in the second tank 11. There it passes down to a lower strand where the impurities of the partially cleaned stock are again deposited directly on the bottom of this tank. Then the stock passes back over between the strands 26 and 27 and finally out at the other end of this tank to an-

other pair of squeeze rolls and the process is continued through as many washings as may be desired.

5 This furnishes a continuous process which does away with the hand labor now generally employed in this industry and brings it up to a modern organization suitable for handling a large amount of material and delivering it in a much better condition and certainly more
10 uniform than has been the case heretofore. Steam is introduced into these tanks at convenient points through pipes 29 and nozzles 30 to heat the liquor and keep it in a state of agitation. The usual scouring solution is
15 used.

Although I have illustrated and described only a single method of operation and only one form of washing bowl and aprons, I am aware of the fact that modifications can be
20 made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction nor the exact steps of the
25 method but what I do claim is:—

1. The combination with a silk washing tank for receiving the scouring solution, of a perforated apron having a horizontal portion outside the intake material end of the tank
30 beyond and above it on which the stock can be deposited from above it, guide rolls arranged to direct this apron directly downward toward the bottom of the tank at the intake end, guide rolls arranged to guide the
35 apron near the bottom of the tank from the intake to the discharge end and then back and

forth through the tank, up out of the tank at the discharge end, and back to the intake end underneath the first horizontal strand of the apron mentioned, a second apron in the tank having means for guiding it from a position above the receiving strand of the first apron in contact with the stock thereon down to a point near the bottom of the tank and along with the first apron throughout its
45 course to the discharge end of the tank and then back through the tank to the starting point but leaving a part of said horizontal portion exposed from above.

2. The combination with a silk washing tank for holding the scouring solution, of a perforated endless apron having a horizontal portion at the intake material end of the tank and elevated above it and beyond its end for receiving the stock upon it, guide rolls arranged to direct this apron directly downward toward the bottom of the tank at the intake end, guide rolls arranged to guide the apron along near the bottom of the tank from the intake to the discharge end and then back and forth through the tank horizontally at progressively higher levels, up out of the tank at the discharge end, and back to the intake end underneath the first horizontal strand of the apron mentioned and means for
65 holding the stock against the apron throughout its course from the horizontal portion to the discharge end of the tank.

In testimony whereof I have affixed my signature.

CHARLES G. SARGENT.