

May 29, 1934.

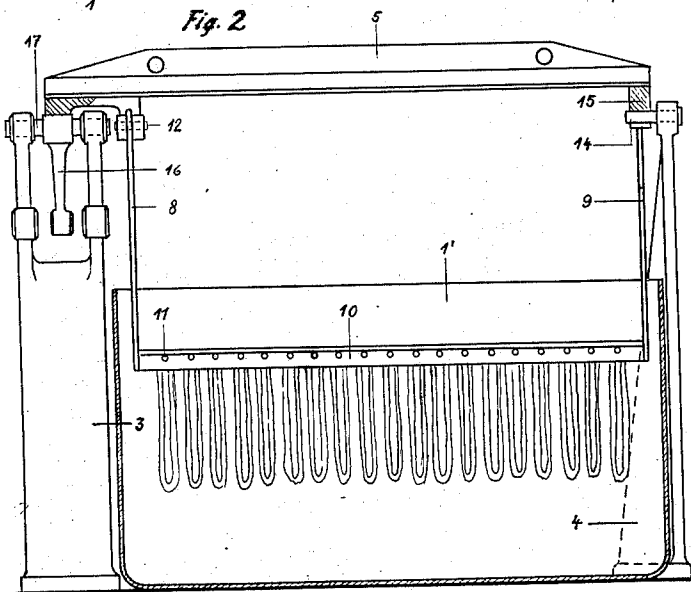
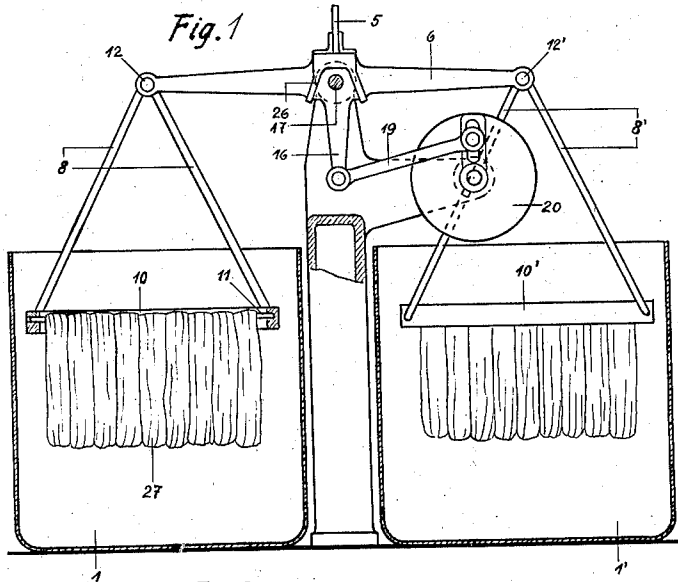
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1,961,074

WASHING MACHINE FOR ARTIFICIAL SILK

Filed Nov. 29, 1930

2 Sheets-Sheet 1



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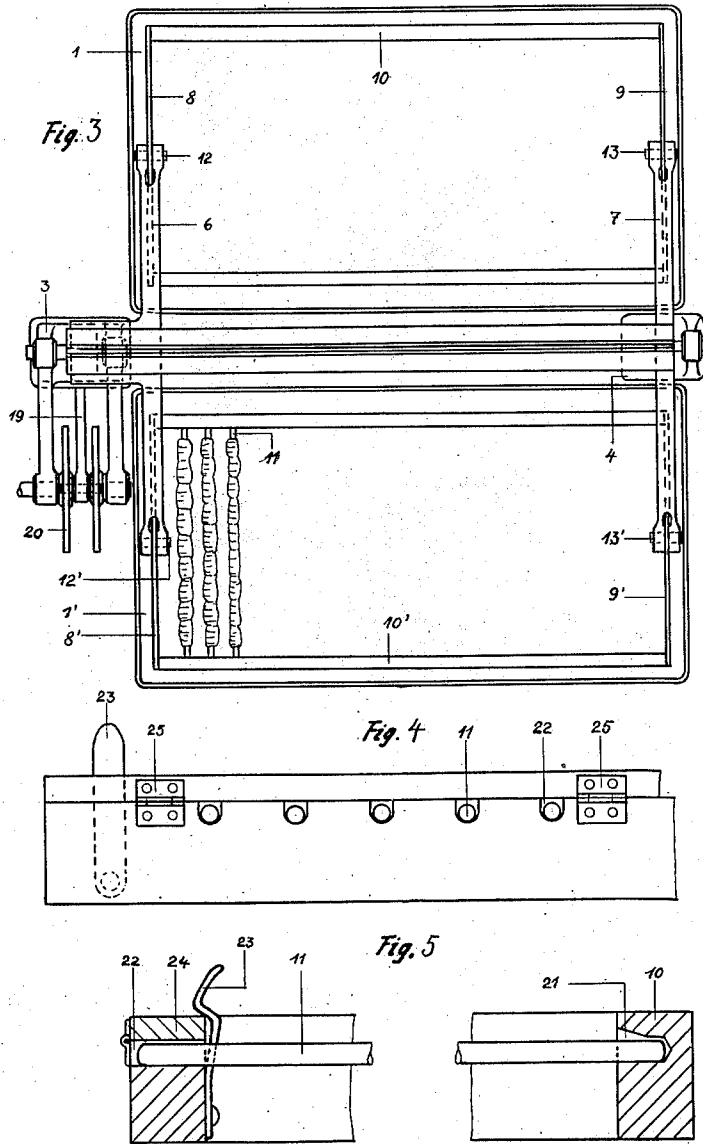
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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

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## WASHING MACHINE FOR ARTIFICIAL SILK

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6 Claims. (Cl. 8—19)

This invention refers to a washing machine for artificial silk in skeins or cakes.

Up to the present time those washing machines which are especially employed for cotton and wool yarn move the skeins located on revolving bobbins through the washing liquid, whereby the yarn movement is caused by the friction between the yarn and the bobbin. It might happen, therefore, that individual layers of the skeins tangle up with one another. This will cause part of the filaments to be affected by tensile stresses, whereas the others hang down in a sloppy way and might tangle up amongst each other so that the consecutive reeling becomes difficult and causes frequent breaking of the filaments.

The drive of these machines is so designed that a shaft parallel to the yarn conveyor rotates the individual yarn bobbins by means of a worm gear.

Sometimes the individual yarn bobbins are connected through spur gears so that the driving of one bobbin will set in motion all the rest of the bobbins. Now, in order to give the rotating skeins an additional movement through the washing liquid, it has been suggested to install the yarn bobbins on a frame movable in a parallel direction towards the washing conveyor.

Those machines now in common use are operating satisfactorily with the exceptions of the above described troubles. They have, however, a very complicated drive which increases the cost of these machines considerably. Furthermore, the drive is exposed to vapors detrimental to its metal parts which are located partly above the washing liquids.

There are, furthermore, known washing machines in which the skeins are located on stationary bobbins or sticks, while the washing liquid is circulated therethrough. In this species of machines the sometimes necessary movement of the skein is not effectuated by actuating the bobbins but by moving to and fro a frame carrying the sticks, or in such a manner that the frame makes a vertical movement and a lateral movement in its lowest position at the same time.

All these machines are therefore difficult to operate and not simple as far as the drive is concerned. The motion of the skeins is not parallel to the skein conveyor so that one of the most important requirements for a uniform washing effect is neglected, namely, a flow of the washing liquid in a lateral direction through the skeins. Also it is difficult to remove the frames since the washing tanks are to be changed as soon as it becomes necessary to move the skeins from one

bath into another. This is particularly important in the washing of artificial silk where quite a number of different washing tubs are necessary.

This invention relates now to a new machine representing a very simple drive especially advantageous in the treatment of artificial silk. According to the invention, the swinging levers operating the frame are equipped with a double arm mechanism which runs laterally to the tub. The double arm levers are fastened on a beam parallel to the tub. Both ends of these double arm levers carry the yarn frame on which the yarn is supported by means of sticks, bobbins, etc. The beam carrying the double arm levers is set into a swinging motion by means of a crank shaft drive. In this manner the artificial silk is raised and lowered in the washing liquid and also moved to and fro parallel to the yarn conveyor. On account of the even load of each side of the double arm levers, this movement is accomplished in an easy manner with a small power consumption. The yarn conveyor with its double arm levers rests in a loose manner on the swinging levers connected to the crank shaft and can be removed from one washing tub to another, together with the frame, since the symmetrical design of the conveyor offers the advantage of an even distribution of the load.

The crank shaft drive for the swinging motion can be easily constructed in such a manner that it will not be located above the tubs and therefore not be exposed to the detrimental influences of the liquid vapors. In addition to that, the lubricating oil eventually dropping from the driving mechanism will not ruin the washing liquid. Those parts located above the washing liquid do not require lubrication.

The machine is well fit specifically for use with sensitive artificial silk of fine filaments. This yarn especially tends to be affected due to being tangled up as above described and can therefore be treated only with those machines in present use with difficulty, whereas, in my new machine, only the velocity of the swinging motion has to be decreased by changing the crank drive. A decrease in the swinging motion will cause the fine filament yarn to enter the washing liquid in a straight direction, thereby eliminating the disadvantages of the yarn being upset at the moment of touching the surface of the washing liquid. It is self-evident that the yarn can also be treated in the same manner in the form of spools or cakes suspended on sticks which again are carried on the frame of the new machine.

The accompanying drawings represent the object of this invention, where:

Figure 1 shows the washing machine in a side elevation, partly in a cross section;

5 Figure 2 depicts the machine in a side elevation seen from the longitudinal side, partly in a longitudinal cross section;

Figure 3 shows the same in a top view;

10 Figure 4 is a partial view of the carrier frame; and,

Figure 5 shows a cross section through the frame parallel to a carrier beam.

The washing machine consists of two rectangular tubs "1", "1'", which are located parallel to each other at such a distance that there is space enough between them for the two frames "3", "4". On the top end of these frames "3", "4" is suspended, parallel to the longitudinal direction of the tubs, a beam "5", the bearing of which allows rotary movement. This beam carries, vertical to its longitudinal direction, a double arm lever "6", "7" on both ends. Two frames "10", "10'" are fastened to the ends of levers "6", "7" by means of bolts "12", "13" and rods "8", "9".  
25 These rods are adapted to receive the skein conveyors "11".

The skein conveyors are shifted parallel to each other from one end of the frame into the slot "21", after the yarn has been placed upon the sticks. They are secured at the other end by means of a key-way "22" on the other side of the frame and held in position by means of a rod "24", movable around the hinge "25" so that rod "24" is secured by spring "23".

The beam "5" is suspended at one end on the frame "4" by the open bearing "15", which carries the axle "14" about half of the round, whereas, the other end rests on a crank shaft "17", to which a crank arm "16" is fastened. The bearing of the double arm lever "6" carries an adapter surface "26" in the form of a trapeze, permitting an immediate raising of the double arm lever. Crank arm "16" is set in motion by a crank drive "19", "20". In the operation of the washing machine, the tubs "1", "1'" are filled with washing liquid. The crank drive "19", "20" sets the lever "16" into motion which is transmitted over the beam "5", double arm levers "6", "7" and frames "10", "10'" to the skeins "27". Therefore, the skeins "27" located on frame "10" are lowered and raised continuously to and from the washing liquid.

After the washing process is completed, the skeins must be shifted to another bath and the whole apparatus, consisting of beam "5", levers "6", "7" and frame "10", "10'", must be raised by means of a crane conveyor in order to be shifted to the next step of operation. The same arrangement can be used advantageously in the yarn transport to the washing department and from the washing department to the dryers.

Having now set forth my invention as required by the patent statutes, I claim:

1. In a washing device of the class described, liquid containing tanks, supports located therebetween, one of said supports being provided with an open bearing, a lever pivotally mounted on the other of said supports and having an enlarged rounded end, a beam mounted on said supports

and resting on said bearing and the rounded end of said lever, double armed levers secured to said beam, yarn transporting and carrying means secured to said levers and suspended over said tanks, and the means to actuate said lever whereby to impart oscillatory movement to said beam, and whereby the beam, double armed levers, and yarn supporting and carrying means may be moved as a unit from said supports after the washing operation.

2. In a washing device of the class described, liquid containing tanks, supports located therebetween, one of said supports being provided with an open bearing, a lever pivotally mounted on the other of said supports and having an enlarged rounded end, a beam resting on said bearing and the rounded end of said lever, said beam being provided with a recess to receive the rounded end of said lever, double armed levers secured to said beam, yarn transporting means secured to said levers and suspended over said tanks, and means to actuate said lever whereby to impart oscillatory movement to said beam, and whereby the beam, double armed levers and yarn supporting means may be moved as a unit from said supports after the washing operation.

3. In a washing device having a plurality of tanks and a pair of supports located therebetween, an open bearing associated with one of said supports, a lever pivotally mounted on the other of said supports, a beam resting on said bearing and said lever, yarn supporting means associated with said beam, and means to impart oscillatory motion to said lever whereby the yarn supporting means may be dipped into said tanks.

4. In a washing device of the class described, a plurality of tanks, yarn supporting and carrying means, supports located therebetween, bearing means associated with said supports, a double armed lever arrangement removably mounted on but oscillatable with said bearing means, said lever arrangement connected to said yarn supporting and carrying means, and means to impart oscillatory movement to said bearing means whereby the yarn supporting and carrying means may be dipped into the tanks.

5. In a washing device of the class described, liquid containing tanks, yarn supporting means, supporting means located between said tanks, bearing means associated with said supports, a double armed lever arrangement removably mounted on but oscillatable with said bearing means, said lever arrangement having secured thereto said yarn supporting means, and means to impart oscillatory movement to said bearing means comprising a crank mechanism and a lever actuated thereby and detachably secured to said lever arrangement.

6. In a washing machine for artificial yarns, in combination, a plurality of tanks, supporting means located between said tanks, frames adapted to support and carry the yarn, a crank device mounted on said supporting means for imparting motion to the frames comprising a lever mechanism, adaptors operatively connecting said frames and crank drive, said adaptors being removably associated with said frames whereby after treatment the frames may be removed from said adaptors.

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