

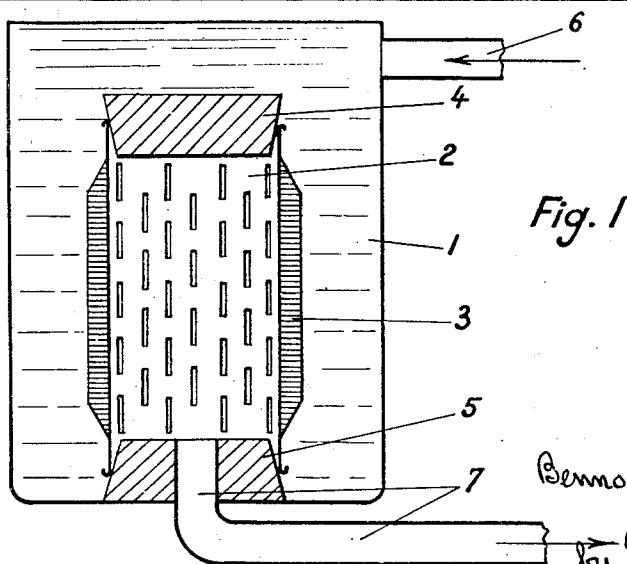
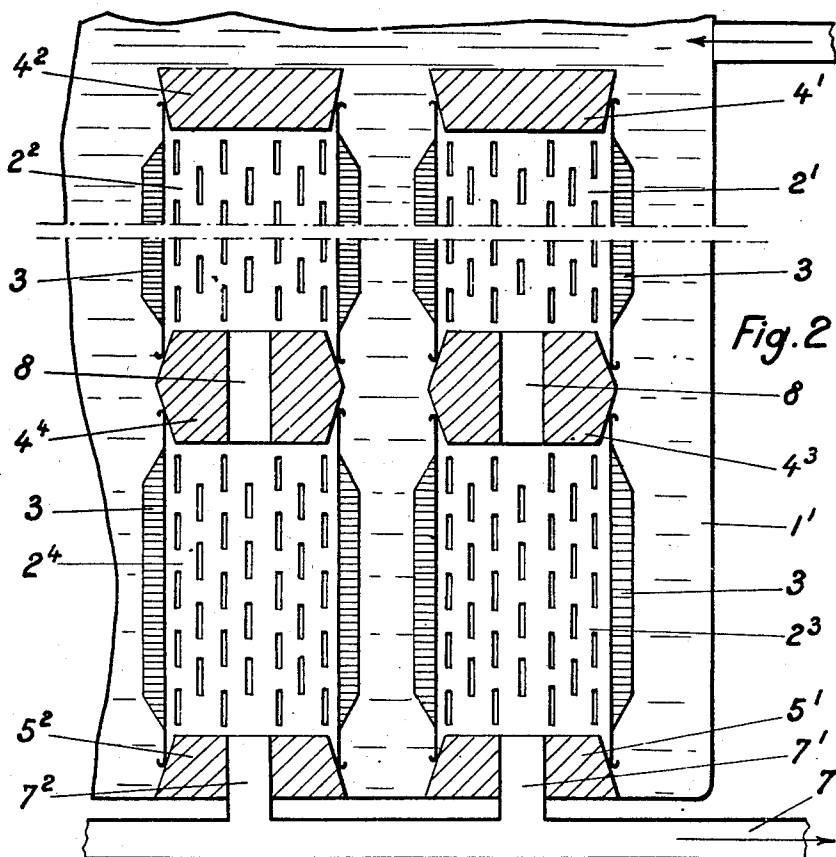
Dec. 2, 1930.

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1,783,493

METHOD OF WASHING YARN OR THREADS WOUND UPON SPOOLS

Filed July 16, 1925



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UNITED STATES PATENT OFFICE

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METHOD OF WASHING YARN OR THREADS WOUND UPON SPOOLS

Application filed July 16, 1925, Serial No. 44,079, and in Germany September 2, 1924.

The washing of artificial silk wound upon spools has hitherto been accomplished chiefly through the use of either of two methods by the spraying or dripping of water on 5 spools arranged in superimposed rows or by dipping the spools in tanks containing the washing fluid. During both of these methods the silk remains under the action of the chemicals to be removed since in the spray 10 or drip process the lower spools receive the washings from the upper rows and the presence of injurious chemicals in the dip process is obvious. It is true that by winding the artificial silk upon perforated bobbins 15 washing liquid will penetrate more readily through the mass of yarn or thread, but the use of perforated bobbins does not, in itself, remove the above mentioned drawback. Moreover, the present method of washing artificial silk wound upon bobbins takes a very 20 considerable time, sometimes many days, according to the nature of the water used, thus making necessary the use of a large number of bobbins and a related number of 25 spool carriers or tanks.

The present invention is based on the observation that if it were possible to remove the washing liquid immediately after the same came in contact with the silk and thereby prevent any further contact, the total 30 duration of the washing operation could be reduced to a very considerable extent. This object is attained in a very simple and practical manner by the method and apparatus 35 forming the subject of the present invention which will now be described with reference to the accompanying drawings, showing by way of example two arrangements for carrying out the invention:

40 Fig. 1 is an elevation partly in section of one apparatus and Fig. 2 is a similar illustration of a modified arrangement according to the invention.

According to Fig. 1 a perforated bobbin 2 45 upon which is wound the artificial silk yarn or thread 3, is placed in a receptacle 1. The bobbin is closed at the top end in a water-tight manner by means of a plug 4, and is closed in a similar manner at the bottom by another 50 plug 5 having a discharge opening so that

the washing liquid which enters the washing receptacle at 6 can leave the receptacle through the discharge conduit 7 only by passing through the yarn or threads 3, the perforated bobbin and the lower plug 5 through 55 which the discharge conduit passes.

In the arrangement according to Fig. 2, a number of bobbins 2¹, 2², 2³, 2⁴, arranged side by side and above each other, may be washed at the same time. All the bobbins 60 are placed in the same receptacle 1¹. The bobbins are closed at their upper ends by plugs 4¹, 4². The plugs 4³, 4⁴ inserted between two bobbins arranged above each other are double plugs and are provided with internal 65 bores or ducts 8 through which the washing liquid may pass in a downward direction. The lower bobbins are closed at the lower ends by plugs 5¹, 5², having ducts 7¹ and 7² opening into the common discharge conduit 7. 70

In carrying out the invention by means of either of the described two arrangements, the perforated bobbins carrying as usual the artificial silk, are placed in the receptacle, 75 which bobbins are closed at the ends by means of the plugs. The receptacle is then filled with washing water or liquid until the bobbins are completely covered. A vacuum or suction pump operating through the discharge conduit 7 carries off the washing liquid by drawing it through the silk wound on the perforated bobbin into the hollow core and thus out. If a suction or vacuum corresponding to say 200 to 300 millimeters of 85 mercury is used, a bobbin may be completely washed in about one hour's time. The admission of fresh washing liquid at 6 may be regulated in such a manner as to maintain a constant level of liquid in the receptacle during the whole operation. This process does not in any way damage the yarn or threads and subjects them to a lesser strain than 90 known processes.

It may be observed that the method forming 95 the subject of the present invention not only provides a complete washing but also makes a great reduction in the time required for this and subsequent operations, such as the drying.

It has been already observed in this art, 100

that there are certain disadvantages in subjecting to a washing operation bobbins containing artificial silk yarn or threads more particularly bobbins containing artificial silk yarn or threads carrying still the liquid of the precipitation or coagulation bath, and that it is advantageous to remove the major portion of the precipitation or coagulation liquid before the washing to facilitate and shorten the washing operation, and it has been proposed for this purpose the use of specially built centrifugals or hydroextractors to extract the said coagulation bath by rotating said bobbins in said centrifugals, this has however proven to be unsatisfactory.

According to the present invention, the elimination of the coagulation liquid or precipitation bath may be carried out without the necessity of a separate operation. It is sufficient for this purpose to subject the bobbins placed in the washing receptacle in the manner above described to the action of a suction or vacuum before carrying out the washing operation as such, namely before the empty receptacle is filled with the washing liquid. In this manner a considerable quantity of the liquid of the precipitation bath adhering to the yarn or threads may be rapidly and easily removed. The precipitation liquid thus recovered may be again used in the manufacture, and the duration of the washing operation considerably reduced.

It was further found that by subjecting the bobbins after the washing operation, namely after emptying the receptacle from the washing liquid, to suction, a very considerable quantity of the washing liquid may be easily removed. It is therefore not necessary to remove this washing liquid either by evaporation or by a subsequent drying operation. Drying of the bobbins is therefore facilitated and may be effected in a much shorter time, at a lower temperature and with a much smaller consumption of drying heat, resulting in a better quality.

It will thus be seen that the above described method and apparatus has a great advantage in that it enables several operations, such as the removal of the precipitation or coagulation liquid, the washing of the product and the removal of the washing liquid, to be carried out in one operation, without a repeated handling of the bobbins and without any risk of damaging the yarn or threads.

No claim is made herein to the apparatus above set forth, the same being claimed in a divisional application filed under date of April 16th, 1928, Serial Number 270,372, pursuant to the requirement of division made by the United States Patent Office.

What I claim is:

1. A process for rapidly washing artificial fibers wound upon perforated bobbins or the like, and disposed in a tank, which consists in first, causing the liquid residues of the coagu-

lating bath or the like to be drawn inwardly through the material and the perforations of the bobbins by suction produced within the bobbins; secondly, filling the tank with washing liquid and causing the washing liquid to pass once only through the material and the perforations of the bobbins by a continuation of the suction within the bobbins; and thirdly, cutting off the supply of washing liquid and causing, by maintenance of the suction within the bobbins, the residue of the washing liquid to pass through the material and the perforations of the bobbins.

2. A process for rapidly washing artificial fibers, wound upon perforated bobbins or the like and disposed in a tank, which consists in first, causing the liquid residues of the coagulating bath or the like to be drawn inwardly through the wound fibers and the perforations of the bobbins by suction produced within the bobbins; and secondly; filling the tank with washing liquid and causing the washing liquid to pass once only through the wound fibers and the perforations of the bobbins by a continuation of the suction within the bobbins.

In testimony whereof I affix my signature.
BENNO BORZYKOWSKI