

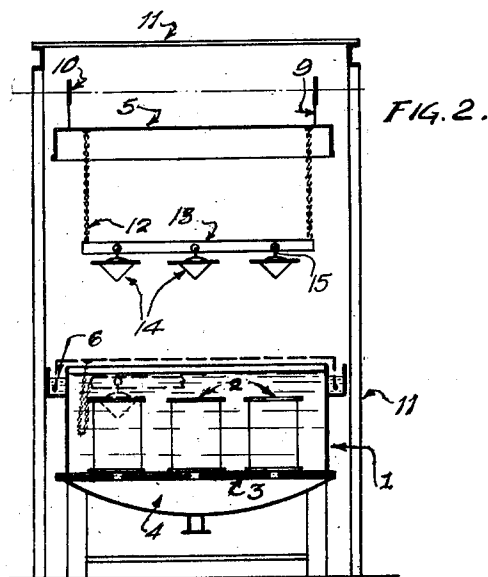
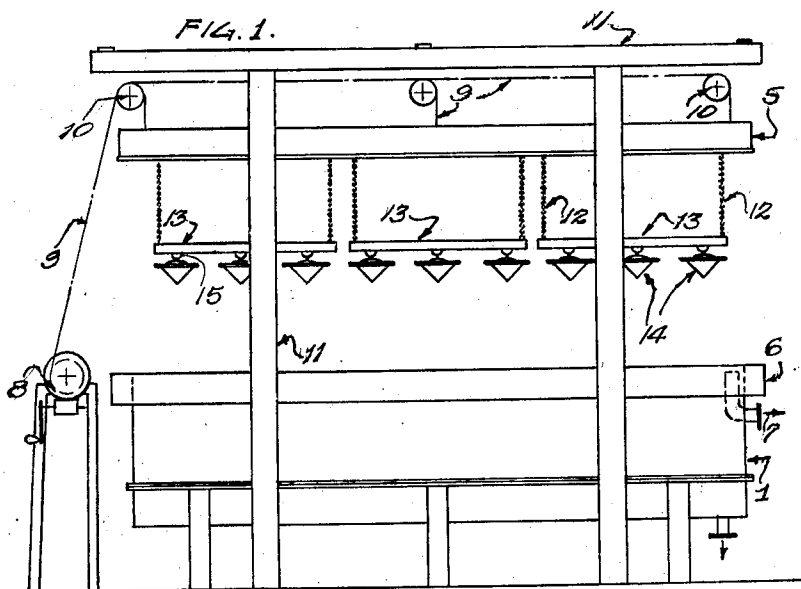
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WASHING AND BLEACHING APPARATUS FOR ARTIFICIAL YARNS

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WASHING AND BLEACHING APPARATUS
FOR ARTIFICIAL YARNS

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1 Claim. (Cl. 8—19)

This invention relates to apparatus for washing, bleaching, reviving and otherwise treating artificial yarns and the like, and refers particularly to a vat provided with a removable cover which in closed position is sealed upon the vat proper to prevent escape of volatile vapors and gases therefrom, there being necessary appurtenances associated with the vat and its cover for facilitating treatment operations and handling the cover.

It is well known that several treatment systems exist having the object of washing, desulfurating, bleaching and reviving in special apparatus the artificial yarns in the forms in which they are manufactured either with the bobbin or with the centrifugal system.

Such apparatus comprises a covered or an open vat in which the bobbins carrying the yarn to be dealt with rest upon a plate or diaphragm dividing the vat proper from its bottom compartment. The plate or diaphragm is fitted with one or more apertures individually corresponding with the center of each bobbin, so that if the upper compartment of the vat containing the bobbins is filled with liquids while a vacuum is formed in the bottom compartment, the liquids are compelled to traverse the yarn layer, the washing and subsequent bleaching operations being thus obtained. As mentioned, the said vats were heretofore open, viz. without any closing cover.

However, in that type of apparatus, no provision is made for collecting the vapors which are evolved and rise to the top of the vat, the cover in this case holding the spools in position and the treatment liquid completely filling the vat up to the cover. In contrast with the art heretofore known, the present invention comprises a washing, desulfurating, bleaching and reviving vat for artificial yarns, characterized by the fact of having applied to it a cover provided with a hydraulic seal. In the present vat according to the invention, all the wet operations can be performed successively which are associated with the treatment of artificial yarns in the form in which they are delivered by the spinning operations, that is, the washing, desulphurating, bleaching and reviving steps in the treatment of such yarns can easily be carried out in the vat without loss of time or escape by evaporation of volatile liquids and perhaps deleterious vapors.

For example, it is well known that viscose artificial yarn as delivered by the spinning department still contains a large amount of carbon sulfide in condensed condition. During the first washing stage, it is customary to use hot water in order to remove the acid. As the ebullition

point of the sulfide is as low as 42° C., large amounts of gaseous carbon bisulfide are developed during this operation, this gas being highly deleterious to the attendants' health. It is therefore usually necessary to provide suction funnels above the vats and, by means of large ventilators, to eject the said gases into the atmosphere in order that they may not poison the surroundings, this object being only partially attained, however inasmuch as it cannot be avoided that a portion of the said gases spread into the air. The hydraulically sealed cover obviates the said inconvenience without further ado, because it will suffice to connect the cover to the atmosphere. The hydraulically sealed cover prevents even the slightest portion of said gases from escaping and contaminating the surrounding air, even without using any ventilators. The air is thus maintained in completely sound condition, with a considerable saving in motive power, by omitting the ventilators.

The accompanying drawing illustrates, only by way of example, a method of carrying out the invention.

In this drawing:

Figure 1 shows a plant diagram in longitudinal elevation.

Figure 2 shows the same in elevated cross-section:

In the practice of my invention, the vat is provided with a cover having the peripheral edge thereof immersed in a liquid located in a channel about the upper edge of the vat so as to form a hydraulic seal, thus rendering possible during the washing, desulphurizing, bleaching and reviving operations the recuperation of the carbon bisulphide as a subsidiary and simultaneous operation, as well as the saving of volatile liquids by preventing their evaporation into the atmosphere.

Referring again to the drawing, the details of the invention may be noted. In the vat 1 the bobbins filled with yarn are disposed on the diaphragm 3 dividing the upper part from the bottom compartment 4 of the vat. The edges of the cover 5 dip into the channel 6 filled with a liquid such as water forming the hydraulic seal. The pipe 7 serves to connect the space between the cover and the surface of the liquid with the outside, and may of course be led as far away as desired from the vat. The cover 5 is raised and lowered by means of the winch 8 and ropes 9 running over the sheaves 10 carried by the machine frame 11. Attached to the cover 5 are

chains 12 supporting the frame 13, upon or from which the bobbin covers are suspended.

A particular feature of this vat is that recovery of the volatile liquids is made in the same vat 5 without any auxiliary condensing apparatus because in order to recover carbon disulphide, for instance, it is sufficient to have water circulation into the channel forming the hydraulic seal, and the condensed volatile liquids are collected in 10 the water seal.

The vat provided with the described channel, being filled with water forming a hydraulic seal with the peripheral edge of the cover also prevents the dispersion into the atmosphere of the 15 volatile liquids where the vat is not completely filled with the liquid used for the treatment.

As may be readily noted in the drawing, the bobbin covers 14, while forming a group which is raised and lowered together, are all independently and individually suspended from the frames 20 13 by means of rings similar to 15, 15, and each bobbin cover is therefore naturally adapted to individually become properly seated upon its respective bobbin when the frame from which it is 25 suspended is lowered.

During the bleaching operations, chemical products (such as ammonium sulfide, for instance) are used which at the temperature at which they are employed are readily volatile and 30 decompose themselves into their gaseous elements. By using a vat filled with a hydraulically sealed cover having been invented, it will suffice that the manometric head of the hydraulic seal be higher than the tension of the vapours of the 35 employed liquids to secure that the evaporation of these liquids will be stopped as soon as the saturation of the small space existing between the surface of the liquid and the cover is attained. This also involves a considerable saving due to the 40 diminution of the required amounts of the chemical products employed.

During the operation, each bobbin is closed by a cover. It is no light hand work to apply and to remove these covers at the beginning and end 45 of each operation.

Hence, it is therefore proposed to let all these

covers be raised and lowered simultaneously by connecting them, through the intermediary of a frame and of some chains, to the vat cover which merely needs to be raised and lowered at the beginning and end of each operation by 5 means of the simple winch-mechanism. In this manner are secured an important time-saving, due to the rapid succession of the operations; a labor-saving, and considerable accuracy in 10 carrying out the operations.

Variations may of course be resorted to, within the scope of my invention, and parts may be used without others. Having now fully described my invention, I claim:—

A vat equipped for carrying out in the same an 15 entire and complete series of consecutive operations such as the washing, desulphurating, bleaching and reviving treatment of artificial yarns in the forms in which they are delivered from spinning operations, including the com- 20 bination, with said vat proper and supporting means for supporting a plurality of bobbins within said vat, of a channel portion formed upon the upper edge of the vat, entirely surrounding the latter and capable of containing a quantity of 25 fluid therein, a cover for said vat having a downwardly directed peripheral edge which in closed position of the cover extends into the channel portion upon said vat and is adapted to be submerged in fluid located in the channel 30 portion so as to form a hydraulic seal, a frame suspended beneath and within said cover as part of the equipment thereof, a plurality of individual covers for said bobbins secured as a group to said frame and adapted to individually en- 35 gage the tops of said bobbins and close the same in closed position of said first cover, means for raising the first cover at will and thereby simultaneously raising said frame and said bobbin covers, and means including a pipe connected 40 with the interior of the vat immediately beneath the first cover and above the interior thereof for leading off to the atmosphere outside the treatment room the vapors and gases in said interior. 45

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